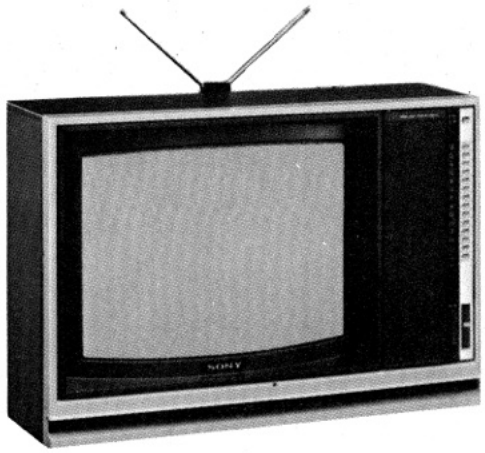
KV-1961/1962

SERVICE MANUAL

US Model

KV-1961
Chassis No. SCC-470O-A
KV-1962
Chassis No. SCC-470N-A



January, 1984

P2 CHASSIS

SPECIFICATIONS

Television system	American TV standards
Channel coverage	VHF channels 2–13 UHF channels 14–69 Cable TV channels 14–36, 98 and 99 (a total of up to 14 preselected channels)
Picture tube	Trinitron tube 19-inch picture measured diagonally 100-degree deflection
Antenna	VHF/UHF telescopic dipole antenna 75-ohm external antenna terminal for VHF/UHF
Speaker	10 cm (4 inches) dia.
Power requirements	120 V AC, 60 Hz
Power consumption	115 W (max.), 73 W (average)
Dimensions	Approx. 674 × 477 × 471.5 mm (w/h/d) ($26\frac{5}{8}$ × $18\frac{7}{8}$ × $18\frac{5}{8}$ inches)
Weight	Approx. 25.6 kg (56 lb 6 oz)
Supplied accessory	Channel number segments (1 strip)

Design and specifications are subject to change without notice.

MICROFILM

TRINITRON® COLOR TV

SONY®

CTV

WARNING!!

AN ISOLATION TRANSFORMER SHOULD BE USED DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD BECAUSE OF LIVE CHASSIS.
THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the condition of the monopole antenna (if any).
   Make sure the end is not broken off, and has the plastic cap on it. Point out the danger of impalement on a broken antenna to the customer, and recommend the antenna's replacement.
8. Check the B+ and HV to see they are at the values specified. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.
9. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

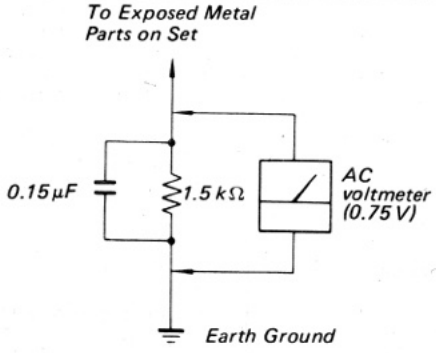


Fig. A. Using an AC voltmeter to check AC leakage.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

HOW TO FIND A GOOD EARTH GROUND

A cold-water pipe is guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground. If the retaining screw is to be used as your earth-ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms. If a cold-water pipe is not accessible, connect a 60–100 watts trouble light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side of the line, the lamp should light at normal brilliance if the screw is at ground potential. (See Fig. B)

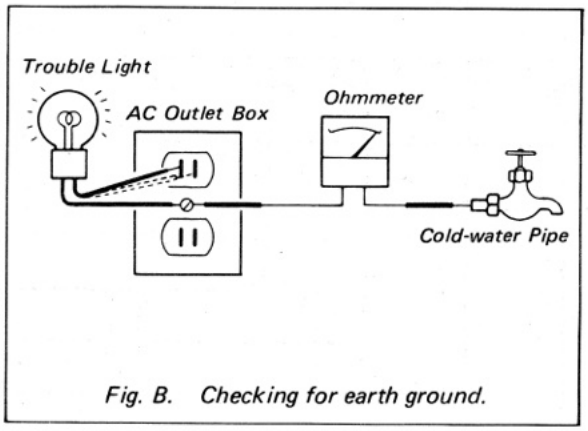
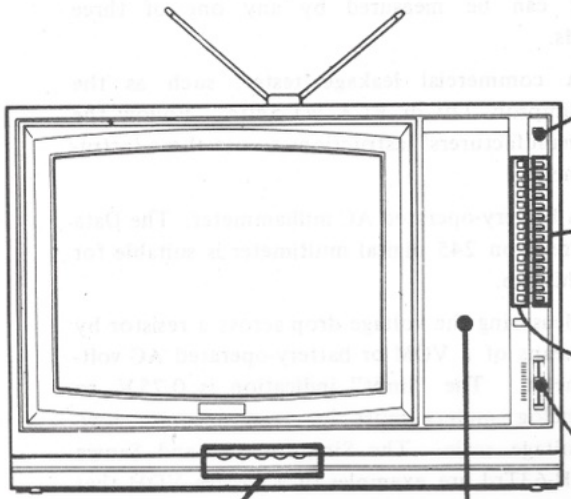


Fig. B. Checking for earth ground.

SECTION 1
GENERAL

LOCATION AND FUNCTION OF CONTROLS



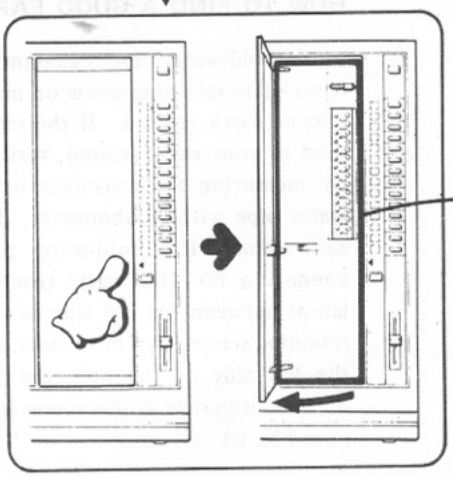
POWER switch
Press to turn on the TV.
Press again to turn it off.

Channel select buttons
Press the desired button to select the channel.

Channel indicators
The selected channel position will light up.

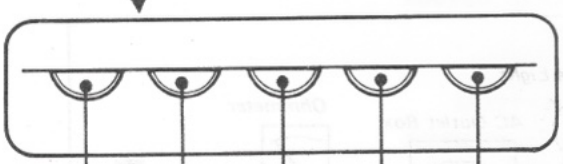
VOLUME control
Slide the VOLUME control upwards to increase the volume or downwards to decrease it.

Push to open.



behind panel

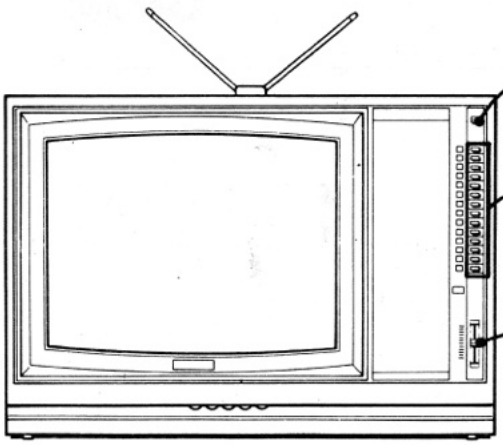
Presetting compartment
All the switches and controls for channel presetting are located in this compartment. A tuning aid is attached onto the panel for your convenience. For the presetting procedure see page 6.



PICTURE control
BRIGHT (brightness) control
COLOR control
HUE control
SHARPNESS control

Use these controls to adjust picture.
See page 5.

OPERATION



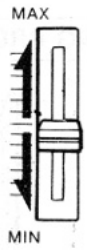
1 **Press the POWER switch.**
The picture will appear.

2 **Press the desired channel select button.**

3 **Adjust the volume by sliding the VOLUME control.**

To increase, slide towards MAX.

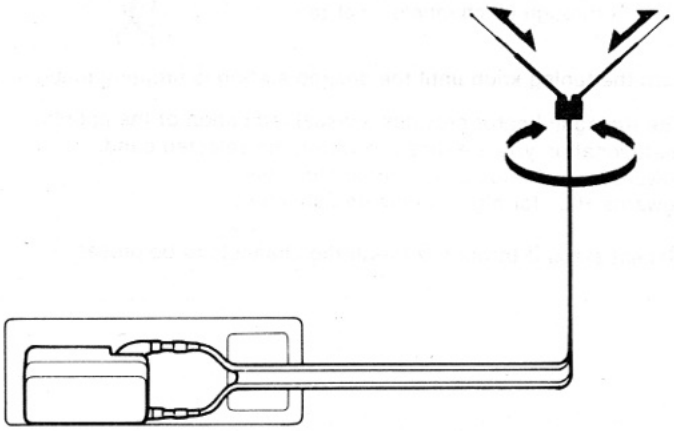
To decrease, slide towards MIN.



To turn the TV off, press the POWER switch again.

INDOOR ANTENNA ADJUSTMENT

Adjust the length, direction and angle of both elements of the attached telescopic dipole antenna symmetrically until the picture is clearest.

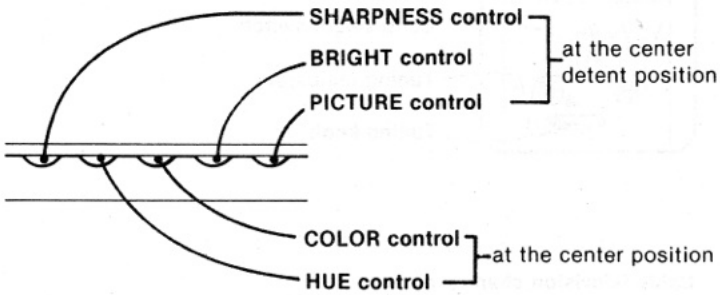


Note
If satisfactory results cannot be obtained with the built-in indoor antenna.

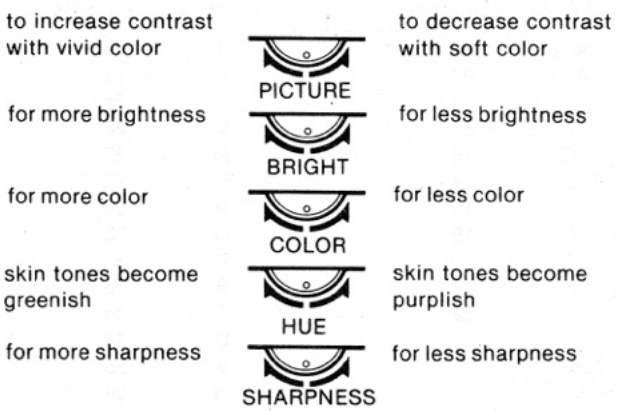
PICTURE ADJUSTMENTS

Satisfactory results will usually be obtained with the controls set at the following positions. If any adjustments are necessary, adjust the required controls as described in the "Adjustment guide".

Normal position



Adjustment guide

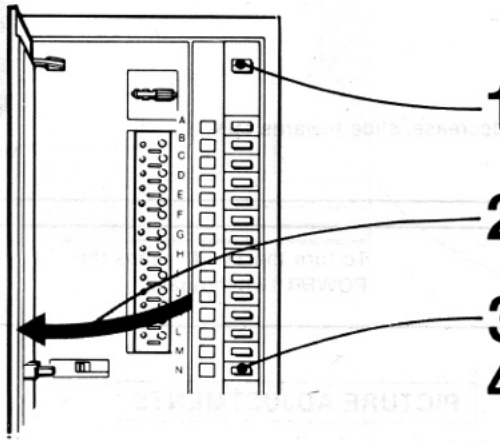


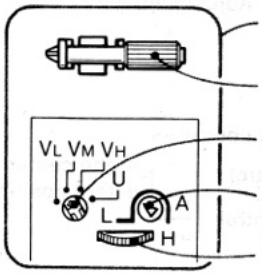
CHANNEL PRESETTING

Your TV set is capable of receiving VHF channels 2 through 13, UHF channels 14 through 69, plus 25 cable TV channels. To preset your TV set so that any receivable channels are added or any inactive channels are cancelled, follow the steps below.
To check each channel and its program, refer to a newspaper or TV program listing.

Note
If you own a video cassette recorder, we recommend that you not reset channel 3 or 4 — whichever is inactive in your area — but use it to receive signals from the video cassette recorder.

PRESETTING PROCEDURE





Presetting compartment
Tuning aid
Band select switch
Tuning indicator
Tuning knob

1 Press the POWER switch.

2 Push to open and expose the controls.

3 Select the channel position to be preset.

4 Using the supplied tuning aid, set the band select switch having the same letter as the selected channel button to one of these four positions:
VHF 2 through 6 channels ..... set to VL
Cable mid-band channels ..... set to VM
VHF 7 through 13 channels and cable super-band channels.... set to VH
UHF 14 through 69 channels .. set to U

5 Turn the tuning knob until the desired station is properly tuned in.

The tuning indicator provides a visual indication of the approximate location you are tuned to within the selected band.
towards L .... for lower-numbered channels
towards H .... for higher-numbered channels

Repeat steps **3** through **5** for all the channels to be preset.

Cable television channel chart*
Cable TV systems use letters or numbers to designate channels. To tune in a channel, refer to the chart below.

Mid-band channels		Super-band channels	
A-2	98	J	23
A-1	99	K	24
A	14	L	25
B	15	M	26
C	16	N	27
D	17	O	28
E	18	P	29
F	19	Q	30
G	20	R	31
H	21	S	32
I	22	T	33
		U	34
		V	35
		W	36

Not all cable TV channels listed will be active in your area. Check with your local cable TV company for more complete information on the available channels.

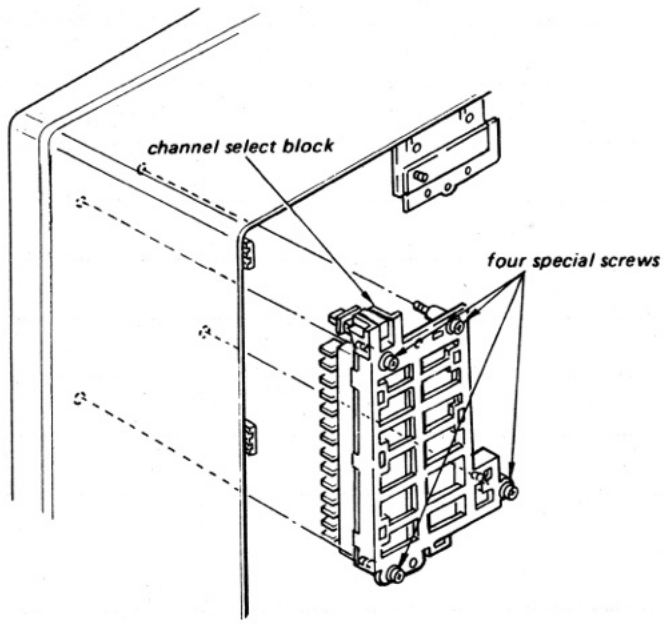
*The designation of the cable TV channels conforms to the EIA/NCTA recommendation.

MEMO

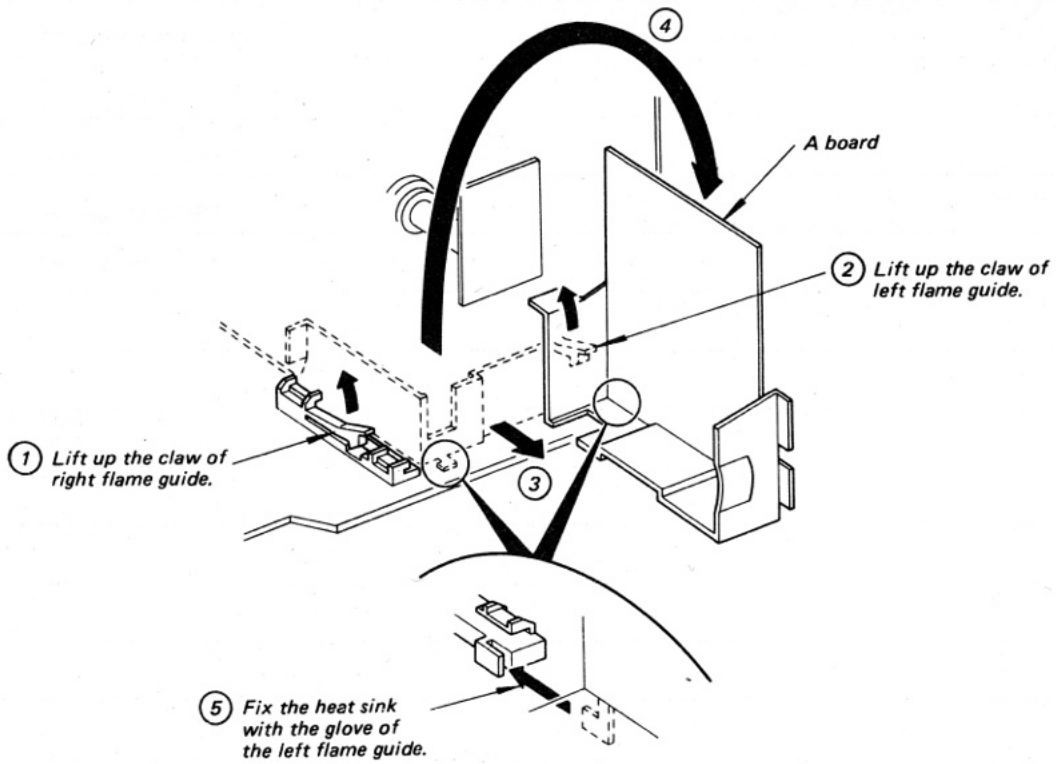
SECTION 2
DISASSEMBLY (AND REPLACEMENT)

2-1. CHANNEL SELECT BLOCK REMOVAL (FOR CHECKING IT UP)

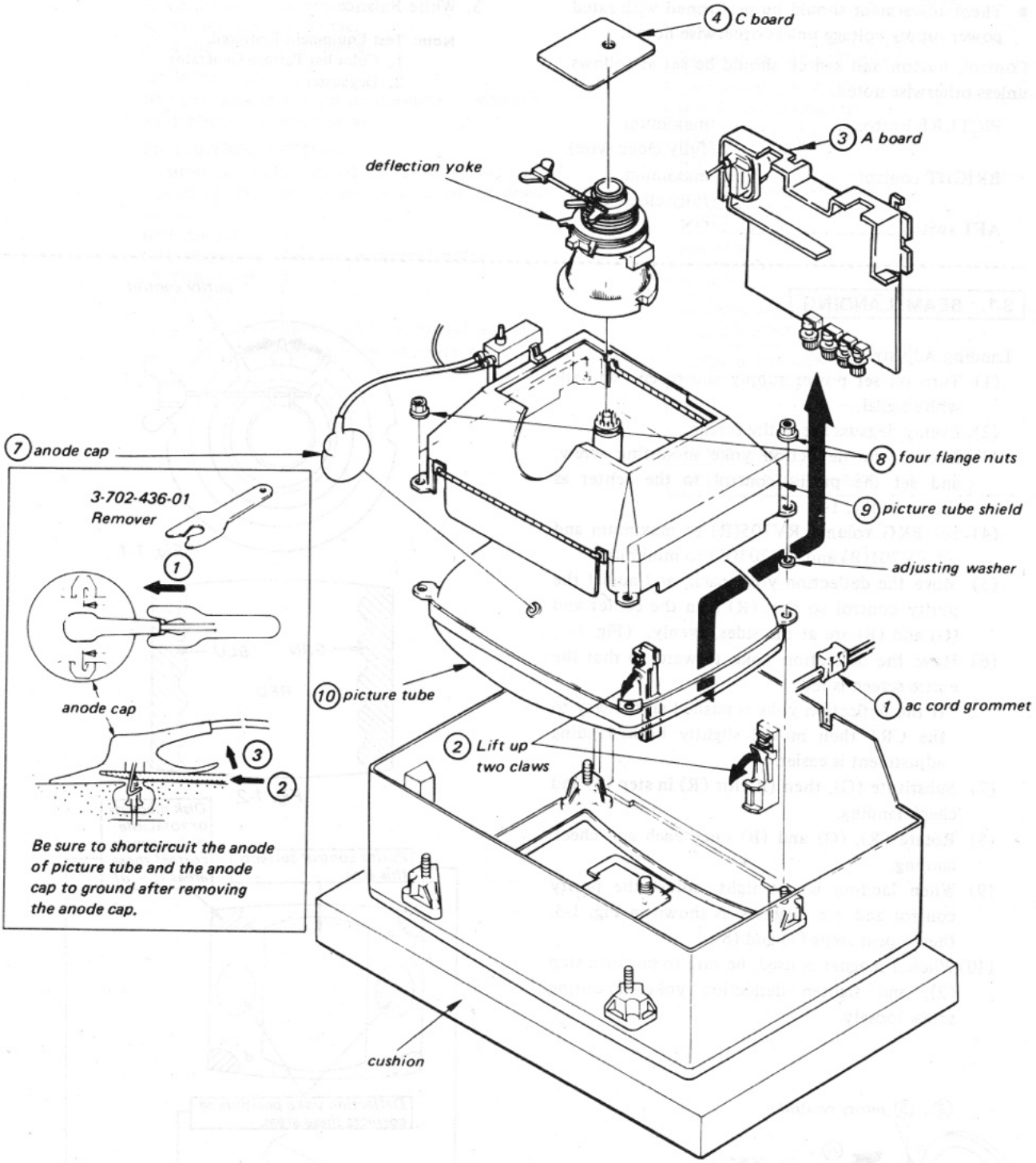
Note: Follow the disassembly procedure in the numerical order given.



2-2. A BOARD REMOVAL (FOR CHECKING IT UP)


4
A board
2 Lift up the claw of left flame guide.
1 Lift up the claw of right flame guide.
3
5 Fix the heat sink with the glove of the left flame guide.

2-3. PICTURE TUBE REMOVAL



SECTION 3
SETUP ADJUSTMENTS

- The following adjustments should be made when a complete realignment is required or a new picture tube is installed.
- These adjustment should be performed with rated power supply voltage unless otherwise noted.

Control, button and switch should be set as follows unless otherwise noted:

PICTURE button . . . . . maximum (fully clock wise)
BRIGHT control . . . . . maximum (fully clock wise)
AFT switch . . . . . ON

Perform the adjustment in order as follows.

1. Beam Landing
2. Convergence
3. White Balance

Note: Test Equipment Required.
1. Color-bar/Pattern Generator
2. Degausser

3-1. BEAM LANDING

Landing Adjustment

(1) Turn on set power supply and receive and all-white signal.
(2) Evenly degauss the entire screen.
(3) Loosen the deflection yoke mounting screw, and set the purity control to the center as shown in Fig. 1-1.
(4) Set BKG volume RV705(R) to maximum and set RV701(B) and RV703(G) to minimum.
(5) Move the deflection yoke back, and adjust the purity control so that (R) is in the center and (G) and (B) are at the sides, evenly. (Fig. 1-2)
(6) Move the deflection yoke forward so that the entire screen is red.
* If the deflection yoke is pushed all the way to the CRT then moved slightly back, landing adjustment is easier.
(7) Substitute (G), then (B) for (R) in step (4) and check landing.
(8) Rotate (R), (G) and (B) once each and check landing.
(9) When landing is not right, adjust the purity control and use magnets as shown in Fig. 1-3, then repeat steps (7) and (8).
(10) When a magnet is used, be sure to perform step (2), and tighten deflection yoke mounting screw loosely.

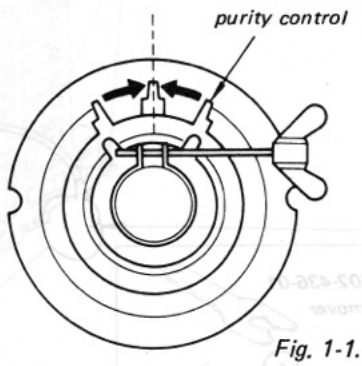


Fig. 1-1.

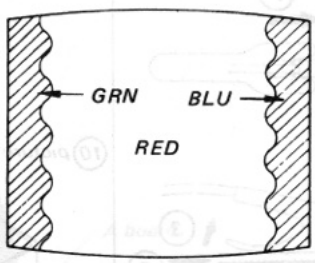


Fig. 1-2.

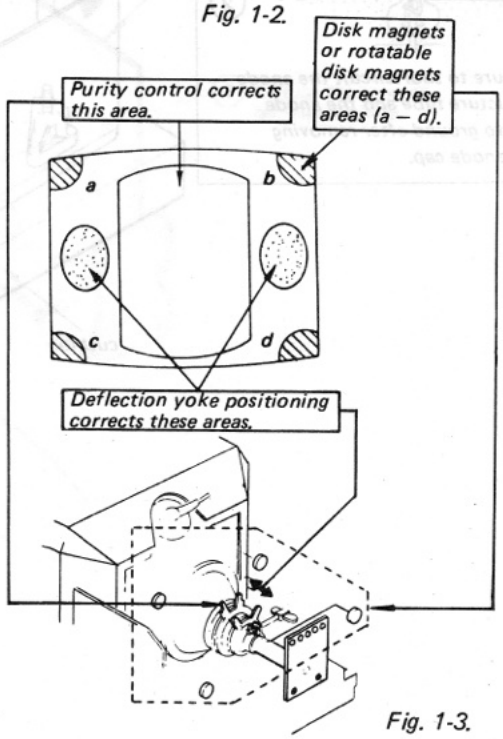
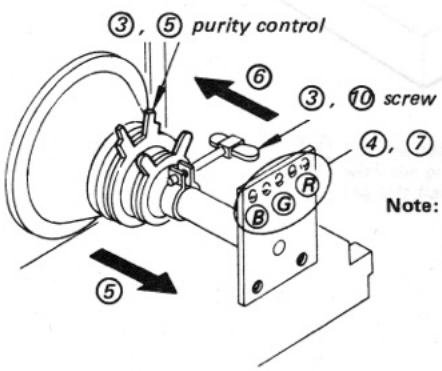


Fig. 1-3.



Note: *The circled numbers (③ – ⑦ and ⑩) shown above steps.*

3-2. CONVERGENCE

Preparation:

- Before starting, perform FOCUS, H. SIZE and V. SIZE adjustments.
- Set BRIGHT control to fully counterclockwise.
- Feed in the dot pattern.

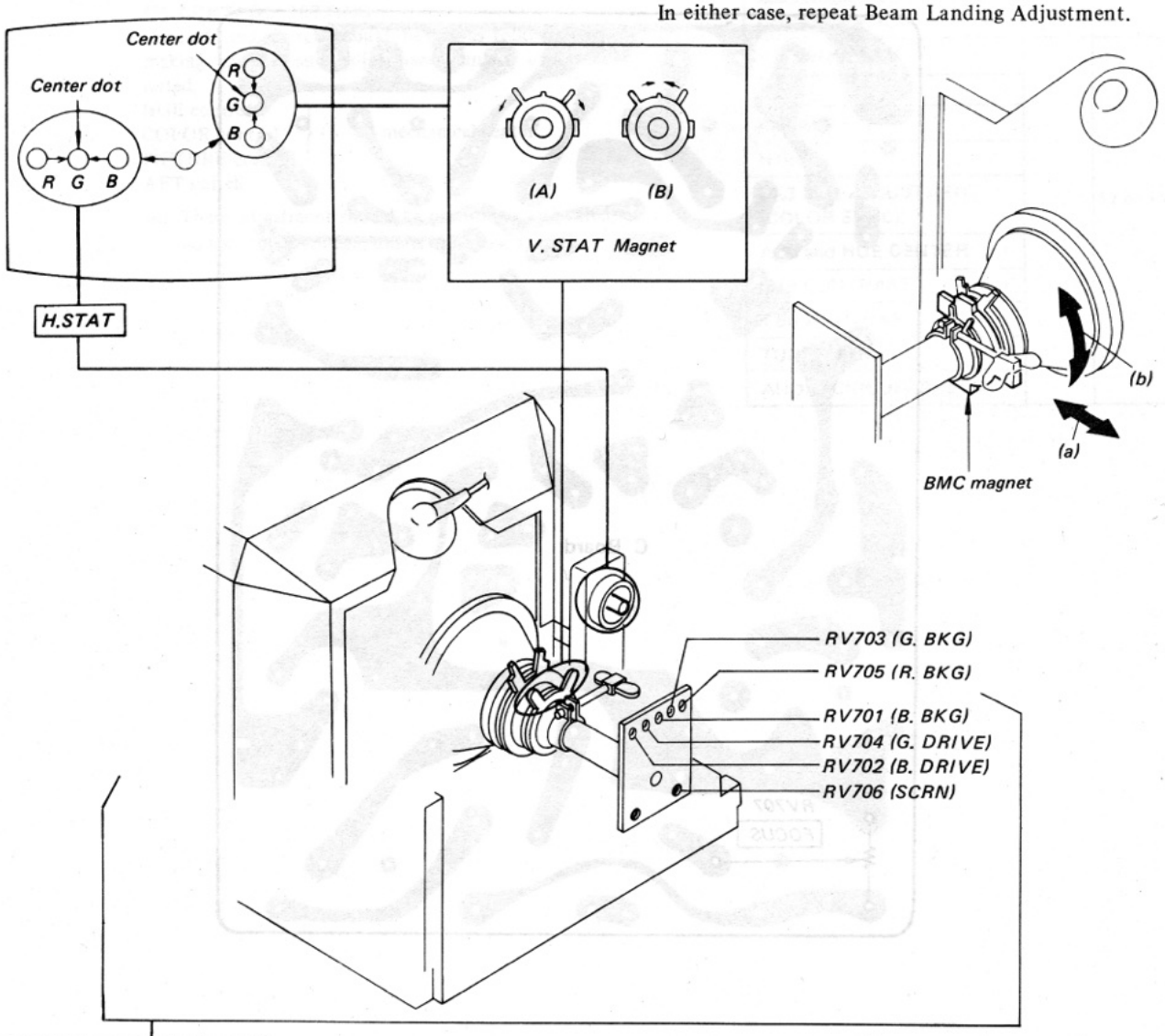
(1) Horizontal and Vertical Static Convergence

If blue dot does not coincide with red and green dots, perform following steps.

Move BMC magnet (a) to correct insufficient H. static convergence.

Rotate BMC magnet (b) to correct insufficient V. static convergence.

In either case, repeat Beam Landing Adjustment.



3-3. WHITE BALANCE

Feed in the cross-hatch pattern.

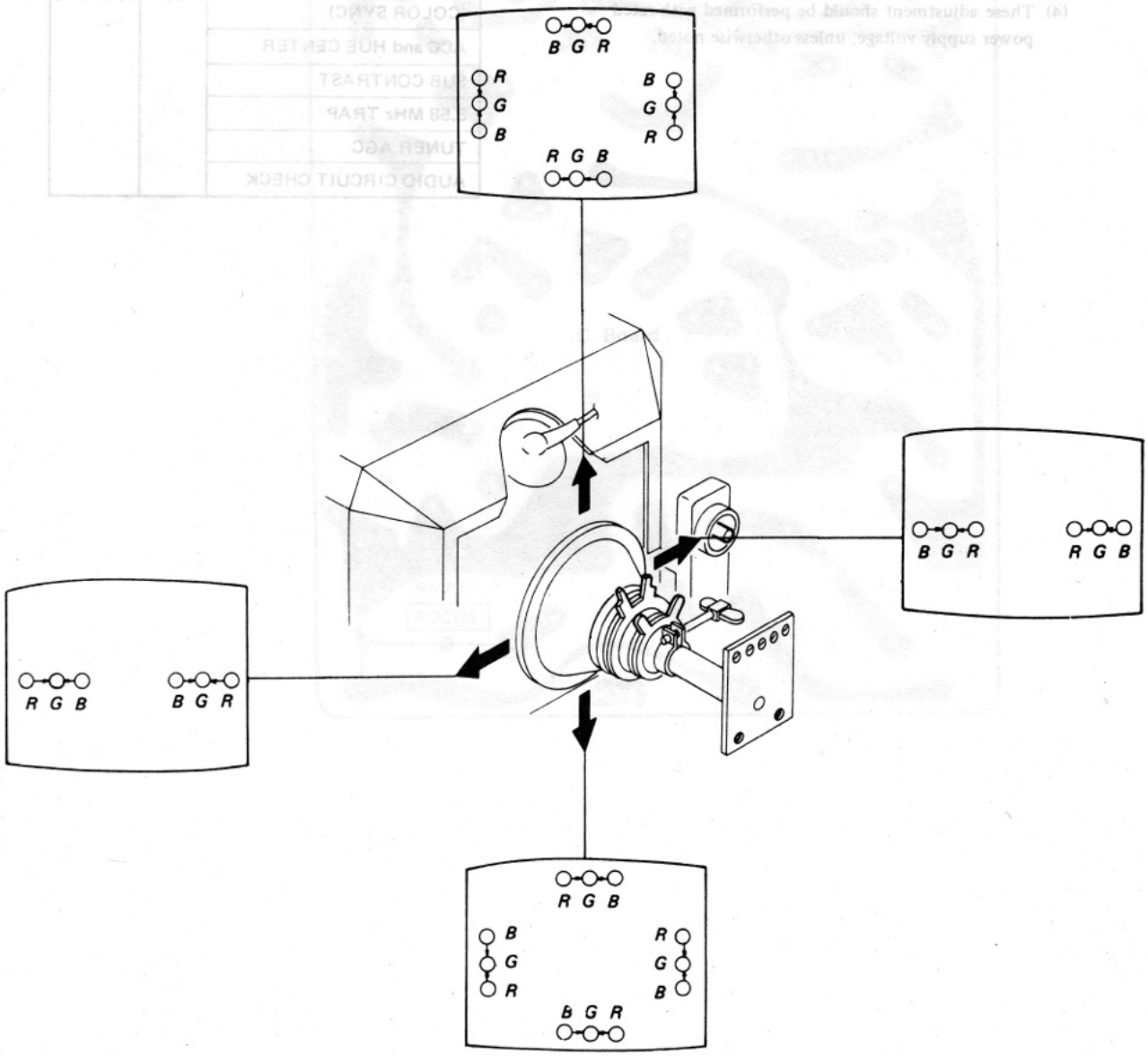
1. Set PICTURE and BRIGHT controls to fully counterclockwise.
2. Turn RV702 (B. DRIVE) and RV704 (G. DRIVE) fully clockwise.
3. Set RV705 (R. BKG), RV703 (G. BKG), and RV701 (B.BKG) to mechanical center.
4. Turn RV706 (SCRN) slowly to obtain a faintly visible cross-hatch. Note the color that first becomes visible by turning RV706. Do not turn a BKG control for this color.
5. Adjust the other two BKG controls for best white balance (neutral gray) of the faint cross-hatch.
6. Set PICTURE and BRIGHT controls to fully clockwise. Observe the screen and adjust the DRIVE controls for best white balance.
7. Repeat Steps 1 through 6 several times.

(2) Dynamic Convergence Adjustment

Preparation:

- Before starting, perform Horizontal and Vertical Static Convergence Adjustment.

1. Loosen deflection yoke screw.
2. Remove deflection yoke spacers.
3. Move the deflection yoke for best convergence as shown below.
4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.



SECTION 4
CIRCUIT ADJUSTMENTS

Note: (1) TEST EQUIPMENT REQUIRED

1. Oscilloscope
2. Digital multimeter
3. Color-bar/pattern generator
4. Variable auto-transformer
5. Audio frequency oscillator

(2) INPUT SIGNAL

When marking these adjustment, supply a crosshatch, a color-bar, or an off-air signal.

(3) CONTROL SETTING

Controls and switch should be set as follows when making checks and adjustments unless otherwise noted.

HUE control
COLOR control
PICTURE control
} . . . . mechanical center

AFT switch . . . . . ON

(4) These adjustment should be performed with rated power supply voltage, unless otherwise noted.

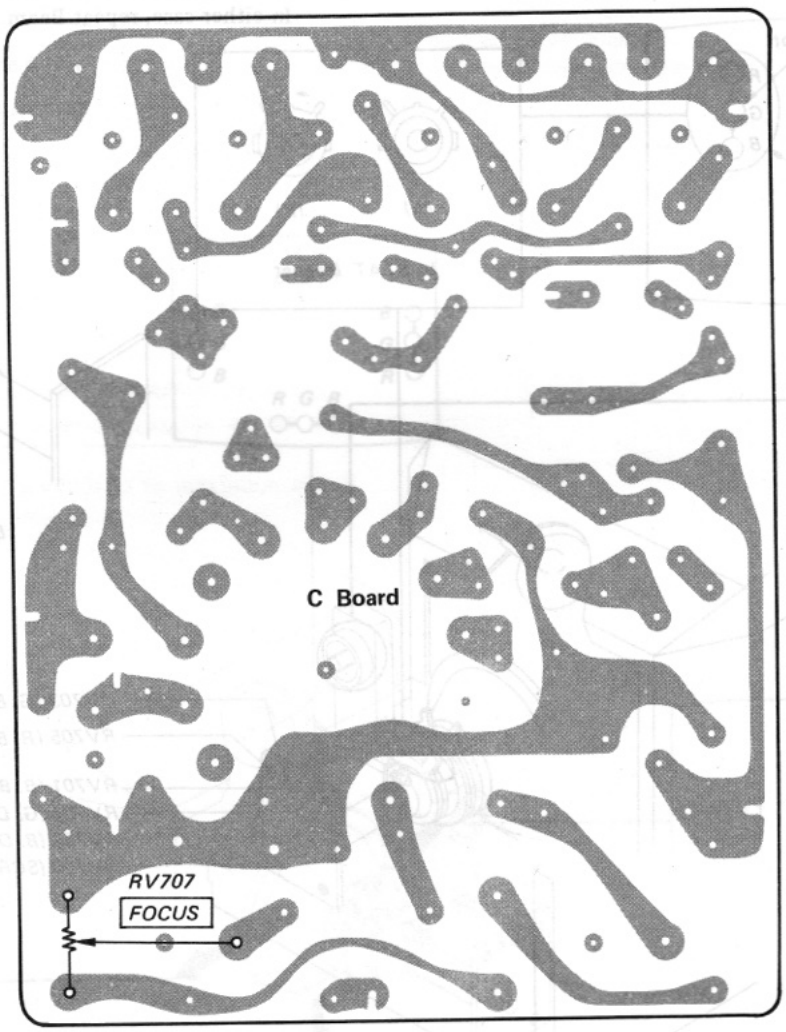
(5) CIRCUIT ADJUSTMENT

Adjustment	Circuit board	Page
FOCUS	C	14
⊠ R582, 583 ADJUSTMENT	A	15 and 16
CHECKING AFTER H.V.R. REPLACEMENT		
MAXIMUM +B VOLTAGE CONFIRMATION		
H FREQUENCY	A	17 and 18
V SIZE		
PIN AMP		
H SIZE		
14.3 MHz ADJUSTMENT (COLOR SYNC)		
ACC and HUE CENTER		
SUB CONTRAST		
3.58 MHz TRAP		
TUNER AGC		
AUDIO CIRCUIT CHECK		

4-1. C BOARD ADJUSTMENT

FOCUS

Adjust RV707 for a best focus.



4-2. SAFETY RELATED ADJUSTMENT

◪ R582, R583 ADJUSTMENT

When replacing the following components, make this adjustment.

R582, R583, IC501, IC503, R558

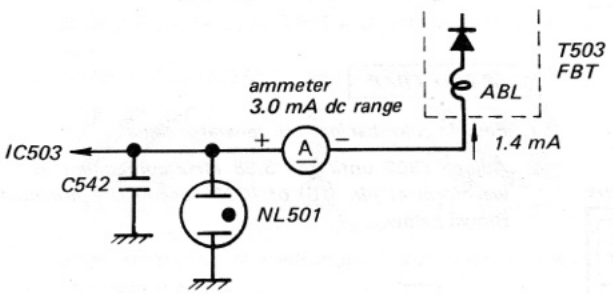
Note: The connection Point for R560 and connector A-10 is the hold down check point (A).

(1) Before Adjustment

1. *Supply 120 V ac to with variable auto-transfomer.*
2. *Confirm that there is more than 12.15 V at the hold down check point (A).*
3. *Remove ac power supply.*

(2) Readjustment Procedure

1. *Disengage ABL terminal of FBT from the foil and connect the ammeter as shown to measure the ABL terminal current.*



2. *Supply 120 V ac to with variable auto-transfomer.*
3. *Receive a stable signal such as an all-white signal and adjust ABL current to 1.4 mA with PICTURE, BRIGHT, etc. controls.*
4. *Confirm that the HV HOLD DOWN CIRCUIT operates and that raster disappears wnen $16.80^{+0.00}_{-0.10}$ V is applied to hold down check point (A) from an external DC power supply. When raster disappears, cut ac voltage and applied dc voltage immediately.*
5. *Supply 120 V ac to with variable auto-transfomer.*
6. *Confirm that the HV HOLD DOWN CIRCUIT does not operate when $16.21^{+0.00}_{-0.10}$ V is applied to hold down check point (A) from an external DC power supply.*
   Note: If the HV HOLD DOWN CIRCUIT operates, immediately cut ac and applied dc voltage.
7. *Receive a stable signal such as a dot signal and adjust ABL current for 85 µA with PICTURE and BRIGHT controls.*
8. *Confirm that the HV HOLD DOWN CIRCUIT does not operate when $17.21^{+0.00}_{-0.10}$ V is applied to hold down check point (A) from an external DC power supply.*
   Note: If the HV HOLD DOWN CIRCUIT operates, immediately cut ac and applied dc voltage.
9. *Confirm that the HV HOLD DOWN CIRCUIT operates and raster disappears when $18.27^{+0.00}_{-0.10}$ V is applied to hold down check point (A) from an external DC power supply. When raster disappears, cut ac voltage and applied dc voltage immediately.*
10. *Adjust R582, R583 so that steps 3, 4, 6, and 7, 8, 9 are satisfied.*
11. *Remove external DC power supply and DC ammeter.*
12. *Solder FBT ABL pin.*

CHECKING AFTER H.V.R. REPLACEMENT

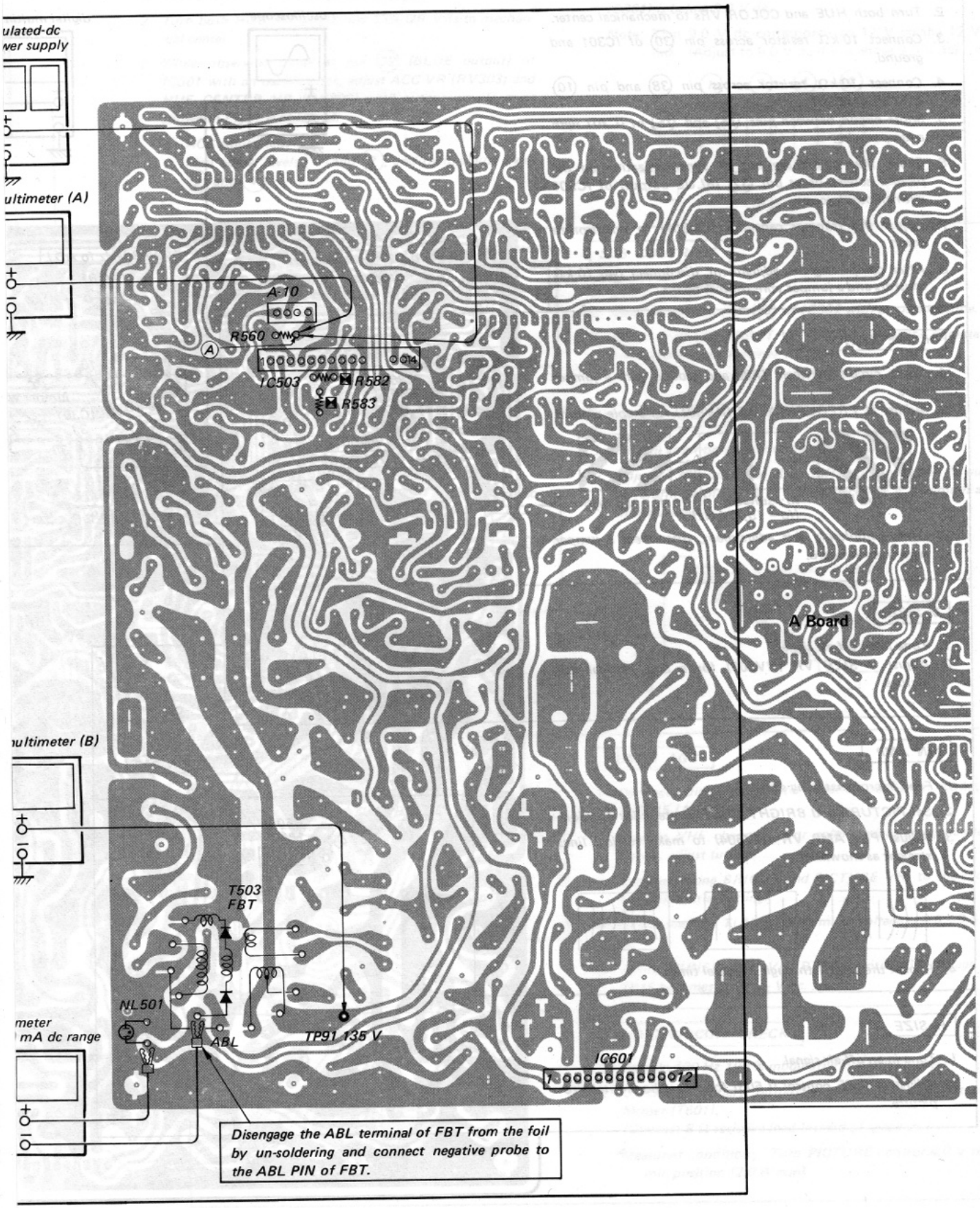
*After replacing H.V.R., *confirm that there is more than 12.15 V on HOLD DOWN check point (A).*

** This check is to be performed when H.V.R. only is replaced, and has no relation to the HV hold down circuit readjustment for replacement of parts marked ◪ .*

Note: The connection Point for R560 and connector A-10 is the hold down check point (A).

MAXIMUM +B VOLTAGE CONFIRMATION

1. *Supply 130 V ac to with variable auto-transformer.*
2. *Tune in an off air signal.*
3. *Set PICTURE and BRIGHT controls to mechanical center.*
4. *Confirm the voltage on digital multimeter is less than 137.3 V dc.*
5. *If step 4 is not satisfied, replace IC601 on A board and repeat above steps.*


ulated-dc
wer supply
ultimeter (A)
A-10
R560
A
IC503
R582
R583
A Board
ultimeter (B)
T503
FBT
NL501
meter
mA dc range
ABL
TP91 135 V
IC601
Disengage the ABL terminal of FBT from the foil by un-soldering and connect negative probe to the ABL PIN of FBT.

4-3. A BOARD ADJUSTMENT

14.3 MHz fo ADJUSTMENT (COLOR SYNC)

1. Feed in color-bar/pattern generator signal.
2. Turn both HUE and COLOR VRs to mechanical center.
3. Connect 10 kΩ resistor across pin (30) of IC301 and ground.
4. Connect 10 kΩ resistor across pin (38) and pin (10) (+12 V) of IC301.
5. Short circuit between pins (15) and (16) of IC301 with a jumper wire.
6. Check that colors are out of synchronization on the picture screen or at pin (32) (BLUE output) of IC301 with an oscilloscope.
7. Adjust the trimmer capacitor (CV301) to synchronize color.
8. After completing this adjustment, disconnect two 10 kΩ resistors and a jumper wire from A board.

H FREQUENCY

1. Short circuit between TP86 and ground with a jumper wire.
2. Adjust H FREQUENCY VR (RV501) for stable picture.

fo: too low — fo: suitable (fo = 15,734 Hz) — fo : too high

3. After completing this adjustment, disconnect a jumper wire from A board.

V SIZE

1. Tune in an off-air signal.
2. Adjust V SIZE VR (RV503) for a best vertical size picture.

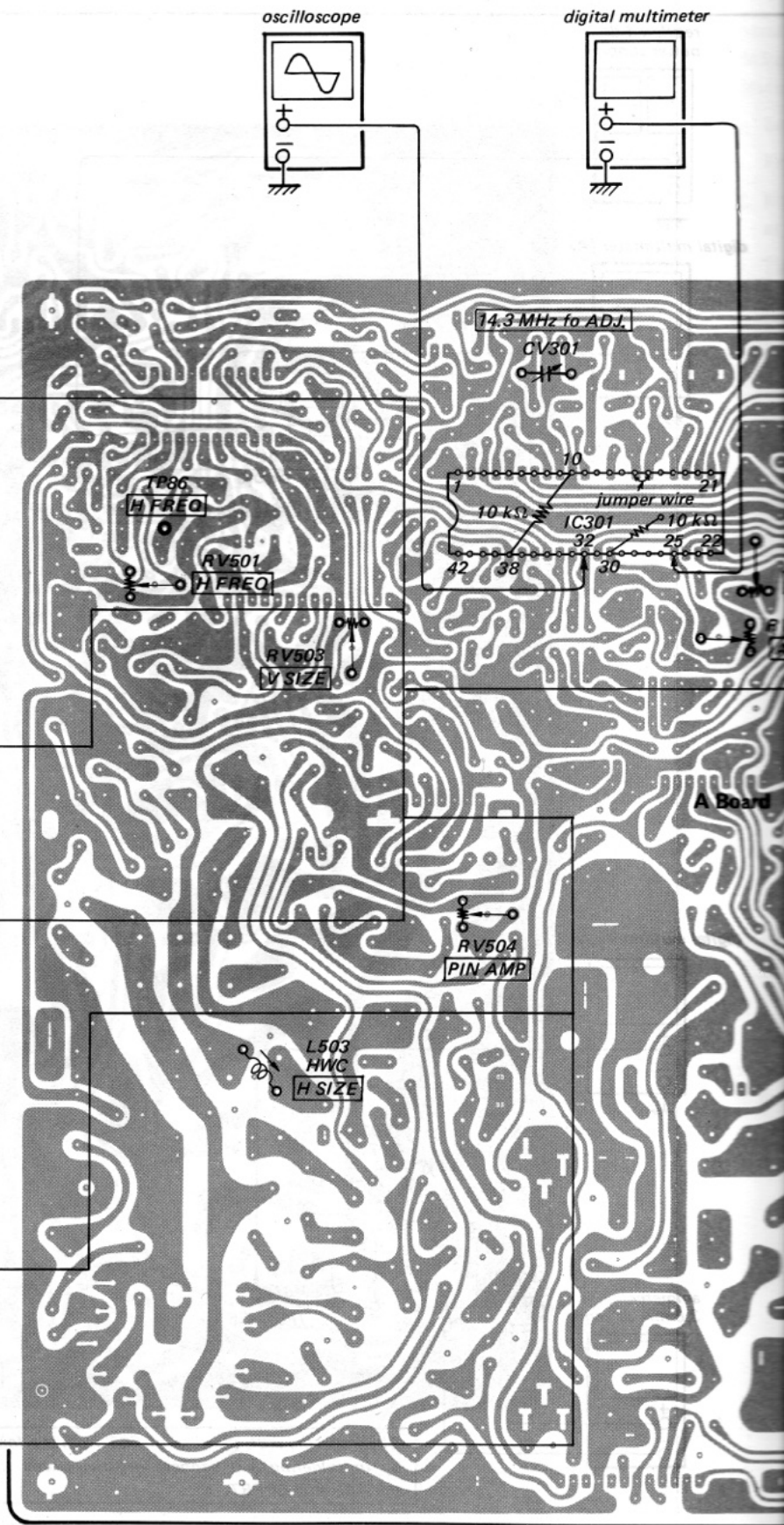
PIN AMP

1. Feed in cross hatching signal.
2. Set PICTURE and BRIGHT VRs to center click position.
3. Adjust PIN AMP VR (RV504) to make vertical lines straight as shown.

4. Repeat the steps 1 through 3 several times.

H SIZE

1. Tune in an off-air signal.
2. Adjust H SIZE control (L503) for a best horizontal size picture.



ACC and HUE CENTER

1. *Feed in color-bar/pattern generator signal.*
2. *Turn both HUE, PICTURE and COLOR VRs to mechanical center.*
3. *While observing signal at pin (32) (BLUE output) of IC301 with an oscilloscope, adjust ACC VR (RV303) and HUE CENTER VR (RV309) until output waveform as shown in Fig. 1 is obtained.*
   - *ACC adjustment*
     First adjust levels (1) and (2), and then, adjust levels (3) and (4).
4. *Check that voltage at ACC VR center (at pin (25) of IC301) is below 9.0 V dc.*

   Note: That 9.0 V dc corresponds to 12 V on the 12 V line. (Adjust to 9.0 V dc if it is above 9.0 V dc)

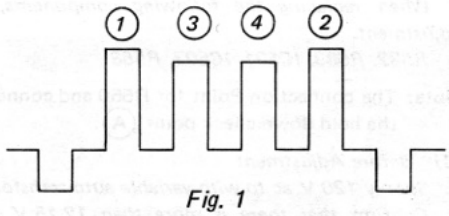
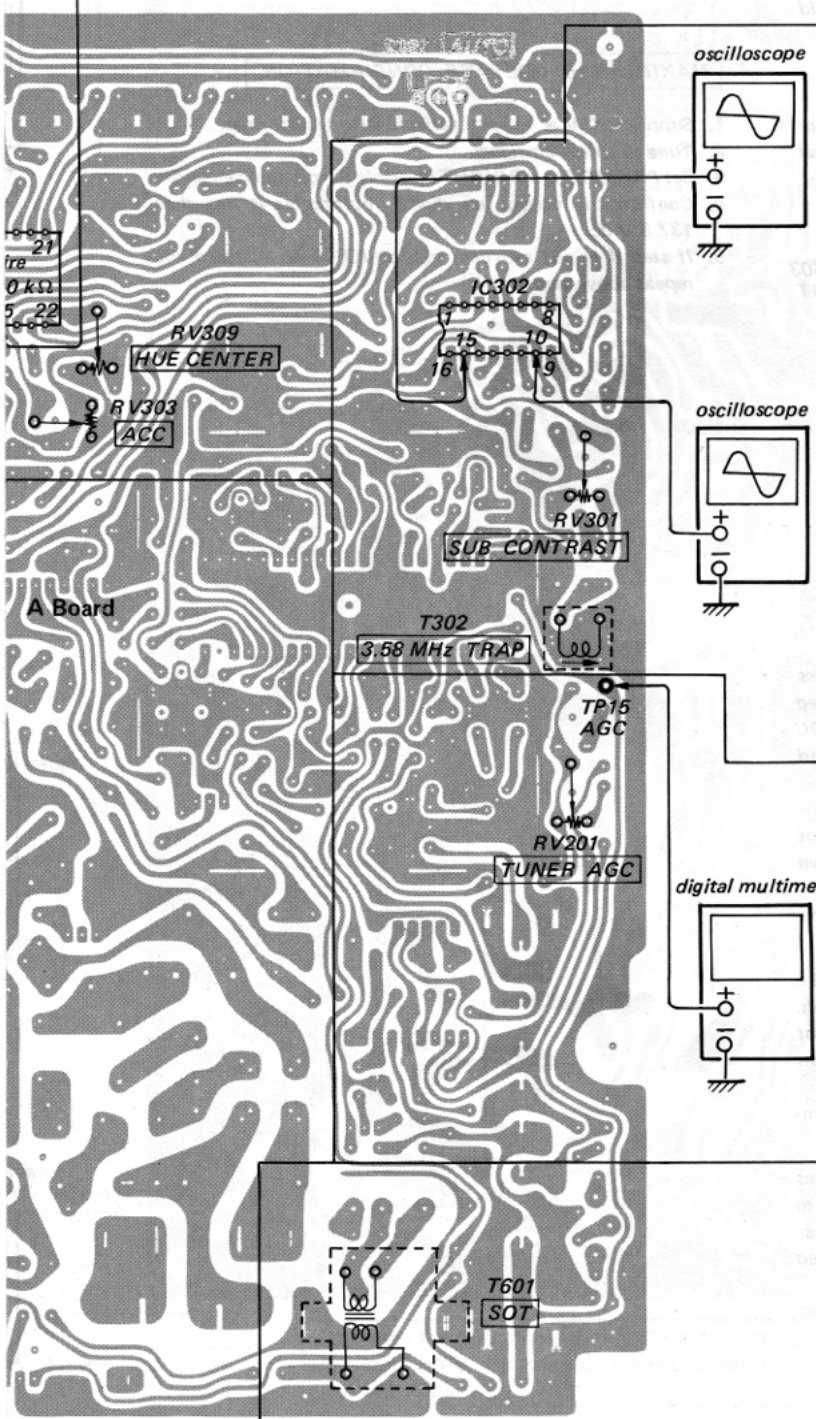


Fig. 1

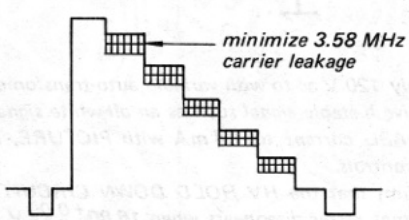


SUB CONTRAST

1. *Feed in monoscope signal.*
2. *Observe signal at pin (15) of IC302 with an oscilloscope.*
3. *Adjust SUB CONTRAST VR (RV301) until the pedestal white signal level becomes 1.3 Vp-p.*

3.58 MHz TRAP

1. *Feed in color-bar/pattern generator signal.*
2. *Adjust T302 until the 3.58 MHz component in Y out waveform at pin (10) of IC302 becomes a minimum as shown below.*



TUNER AGC

1. *Connect a digital multimeter (internal resistance: 10 MΩ) to TP15 (AGC).*
2. *Feed in VHF channel 13 or color-bar/pattern generator signals, adjust tuning.*
3. *Turn and bring BRIGHT and PICTURE VRs to the click position (initial setting).*
4. *Check that the TUNER +B terminal voltage is 8.5 –9.5 V dc.*
5. *Adjust TUNER AGC VR (RV201) until AGC voltage at TP15 becomes $6.5^{+0}_{-0.5}$ V dc.*

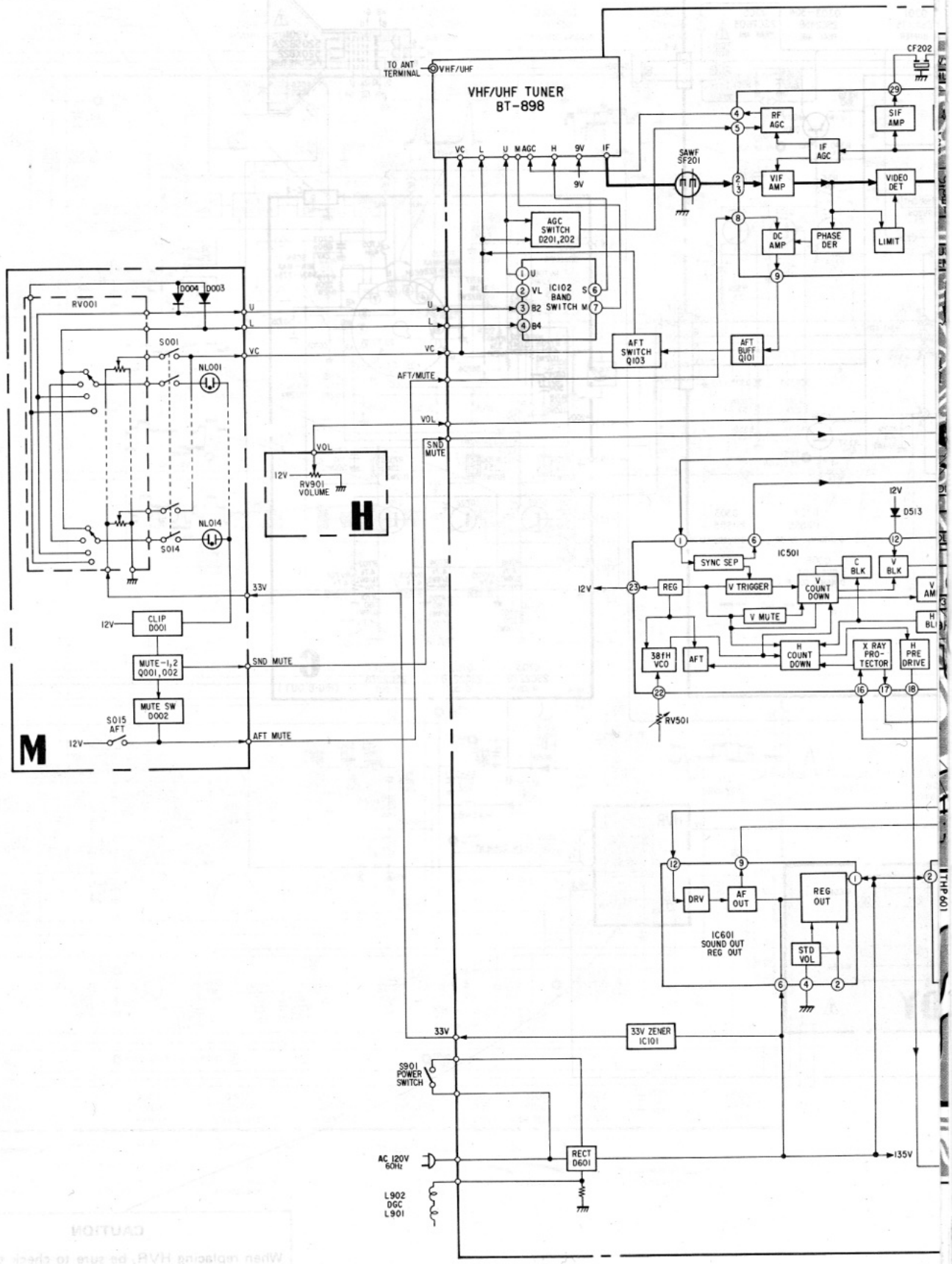
AUDIO CIRCUIT CHECK

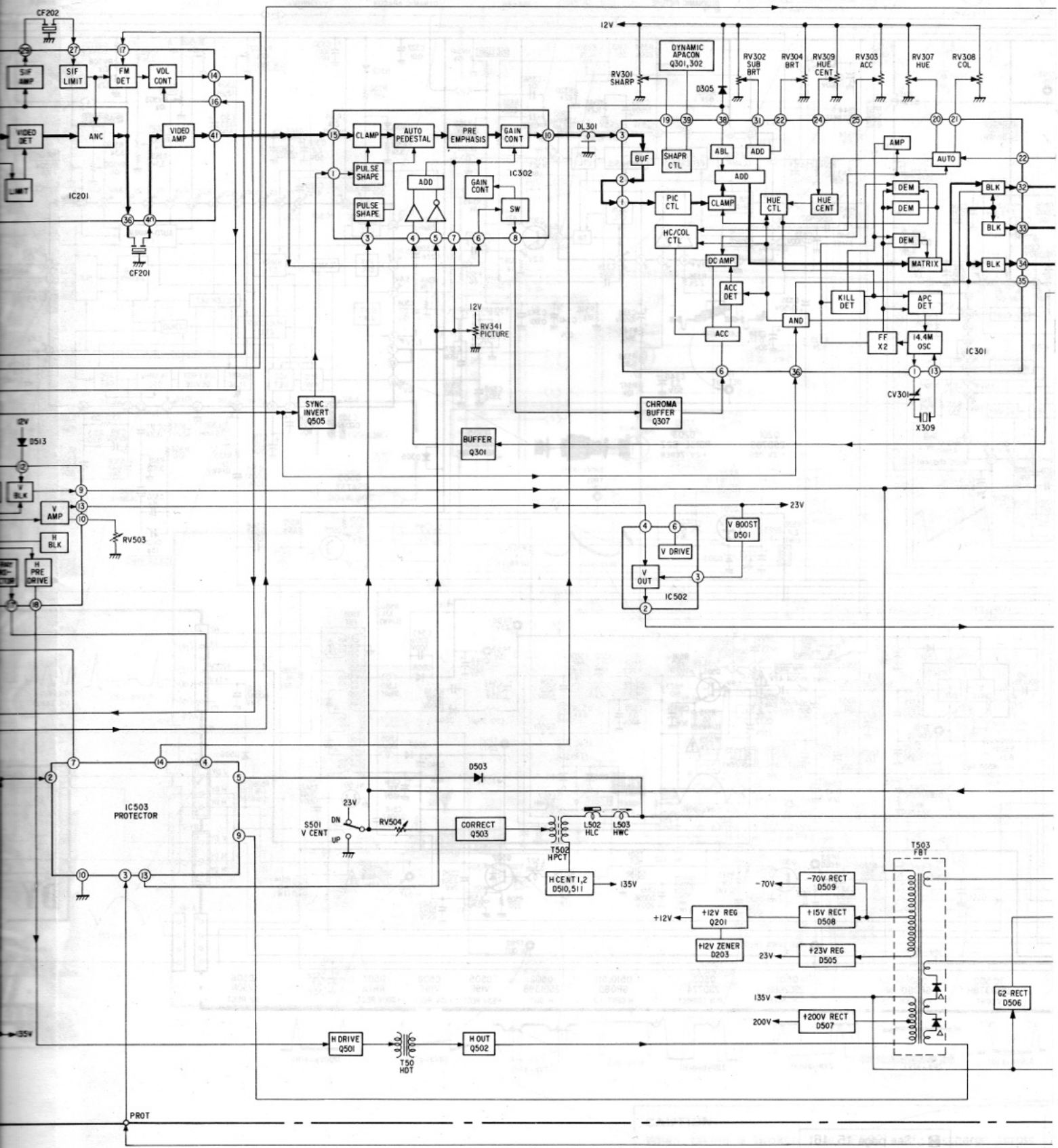
1. *Feed in 400 Hz 100 % modulated signal (±25 kHz).*
2. *Check the 2ndary output of the sound output transformer (T601).*
   (Connect 8 Ω resistive load instead of speakers.)

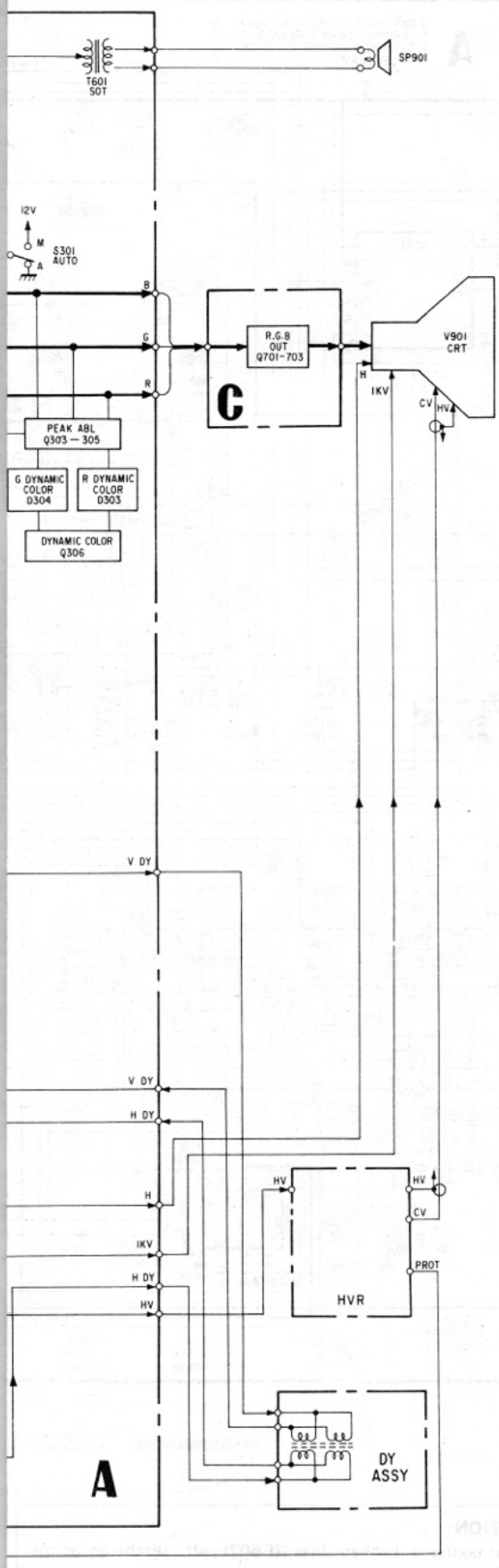
   Measured condition: Turn PICTURE control 4.0 V rms min position (2.0 W min).

SECTION 5
DIAGRAMS AND CIRCUIT BOARDS LOCATION

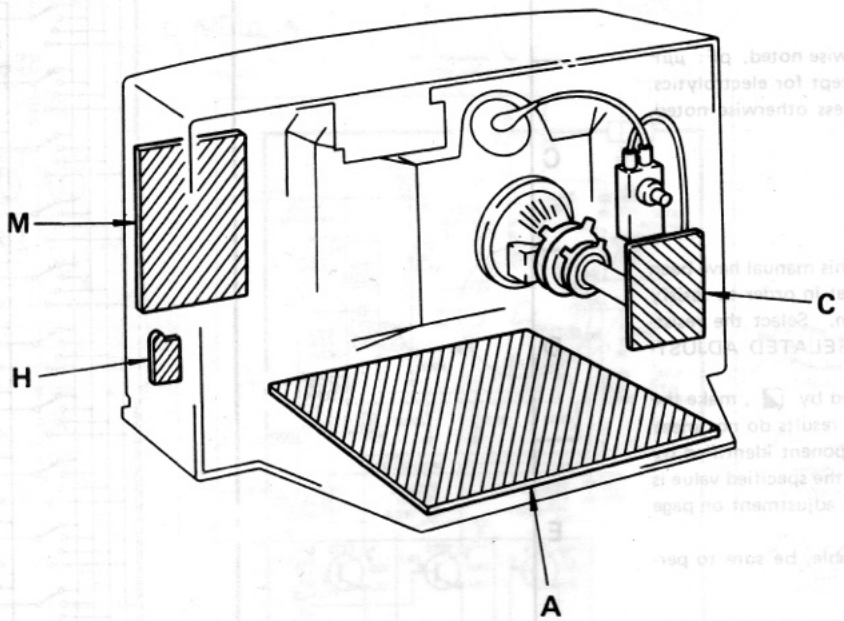
5-1. BLOCK DIAGRAM




CF202
SIF AMP
SIF LIMIT
FM DET
VOL CONT
VIDEO DET
ANC
VIDEO AMP
LIMIT
IC201
CF201
CLAMP
AUTO PEDESTAL
PRE EMPHASIS
GAIN CONT
PULSE SHAPE
PULSE SHAPE
ADD
GAIN CONT
SW
IC302
DL301
12V
DYNAMIC APACON Q301, 302
RV301 SHARP
D305
RV302 SUB BRT
RV304 BRT
RV309 HUE CENT
RV303 ACC
RV307 HUE
RV308 COL
BUF
SHAPR CTL
ABL
ADD
ADD
PIC CTL
CLAMP
HUE CTL
HUE CENT
HC/COL CTL
DC AMP
ACC DET
ACC
KILL DET
AND
APC DET
FF X2
14.4M OSC
IC301
AMP
AUTO
DEM
DEM
DEM
BLK
BLK
BLK
MATRIX
CV301
X309
RV341 PICTURE
SYNC INVERT Q505
CHROMA BUFFER Q307
BUFFER Q301
D513
V BLK
V AMP
H BLK
H PRE DRIVE
RV503
V BOOST D501
23V
V DRIVE
V OUT
IC502
IC503 PROTECTOR
D503
S501 V CENT
DN
UP
23V
RV504
CORRECT Q503
T502 HPCT
L502 HLC
L503 HWC
H CENT 1,2 D510, 511
135V
T503 FBT
-70V
-70V RECT D509
+12V
+12V REG Q201
+12V ZENER D203
+15V RECT D508
23V
+23V REG D505
135V
200V
+200V RECT D507
G2 RECT D506
H DRIVE Q501
T50 HDT
H OUT Q502
PROT


T601
SOT
SP901
12V
M
S301
AUTO
A
B
G
R
R.G.B
OUT
Q701~703
C
V901
CRT
H
IKV
CV
HV
PEAK ABL
Q303~305
G DYNAMIC
COLOR
D304
R DYNAMIC
COLOR
D303
DYNAMIC COLOR
Q306
V DY
V DY
H DY
H
IKV
H DY
HV
HV
HV
CV
PROT
HVR
A
DY
ASSY

5-2. CIRCUIT BOARDS LOCATION



5-3. SCHEMATIC DIAGRAM

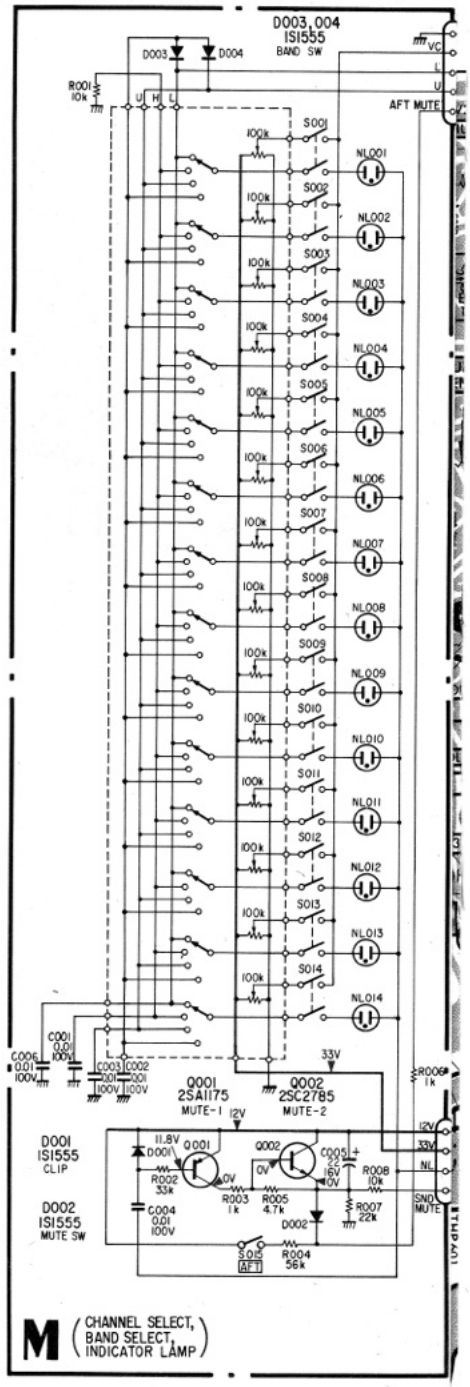
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics.
- All resistors are in ohms, 1/6 W unless otherwise noted. k: 1000 Ω, M: 1000 kΩ.
- : nonflammable resistor.
- △ : internal component.
- ▭ : panel designation.
- The components identified by ⧓ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Select the resistance value according to SAFETY RELATED ADJUSTMENT.
- When replacing components identified by ◪ , make the necessary adjustments indicated. If results do not meet the specified value, change the component identified by ⧓ and repeat the adjustment until the specified value is achieved. (Refer to R582 and R583 adjustment on page 15.)
  When replacing the part in below table, be sure to perform the related adjustment.

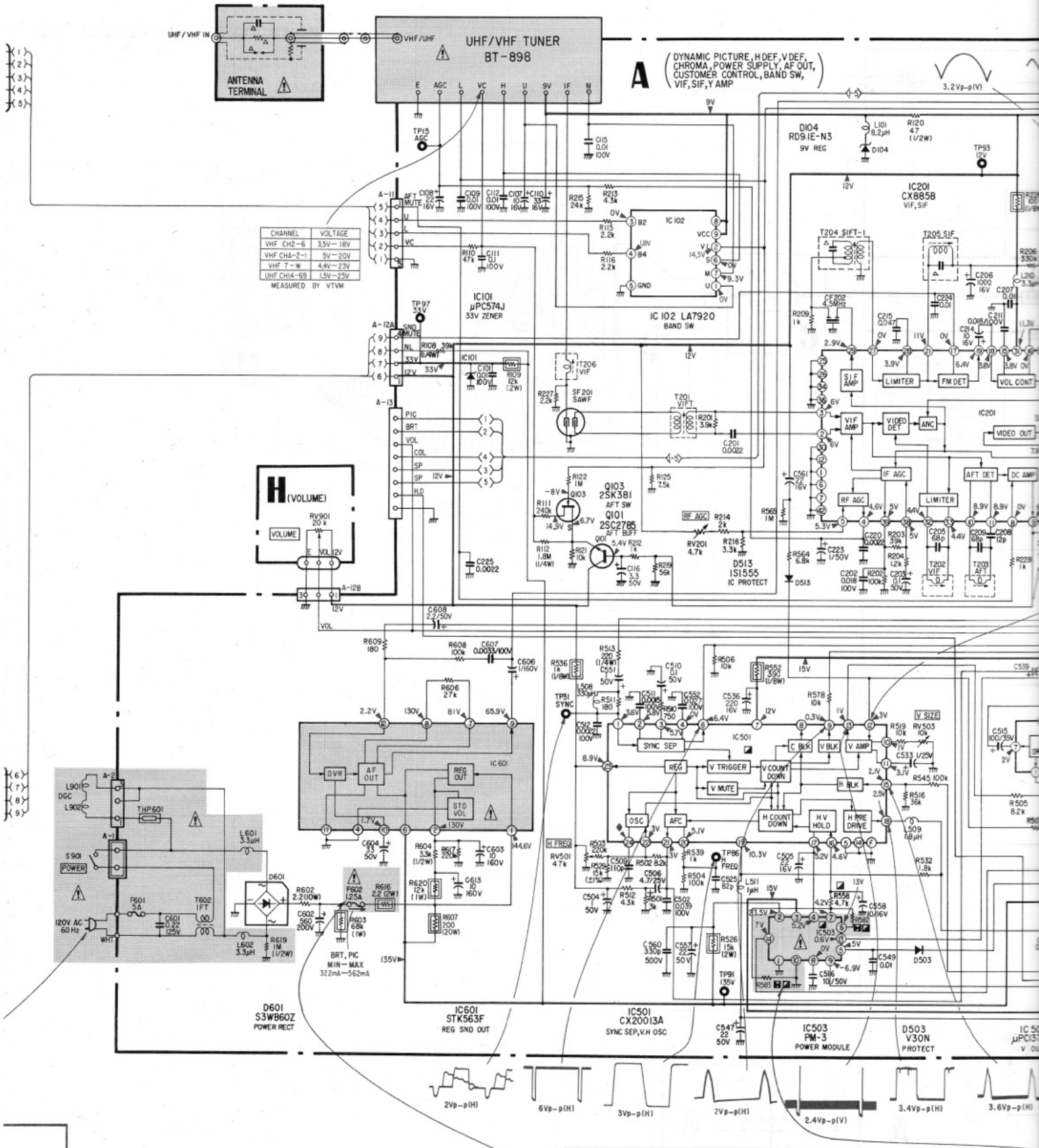
Part replaced (◪)	Adjustment (⧓)
IC501, IC503, R558, R582, R583	R582, R583 adjustment

- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a 10 MΩ digital multimeter.
- Readings are taken with a color-bar signal input.
- ——— : B+bus.
- – – – : B–bus.
- Voltage variations may be noted due to normal production tolerances.
- ▭ : adjustment for repair.
- The hold down check point is the cross-point of R560 and A-10 connector.
- Do not touch pin (24) of IC501 marked ◆ on A board with probe of digital multimeter. It will result in off position of the set.



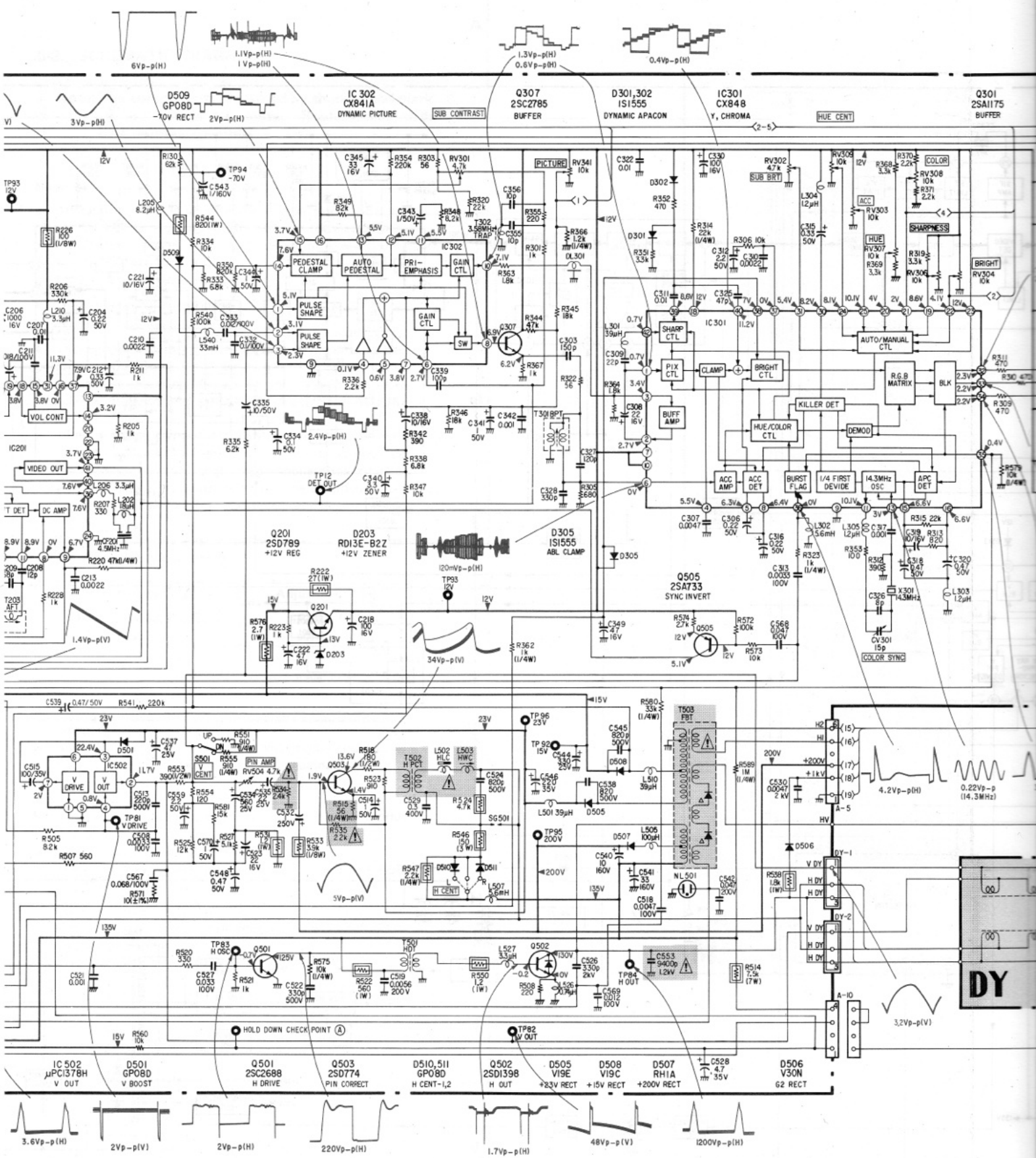
CAUTION:

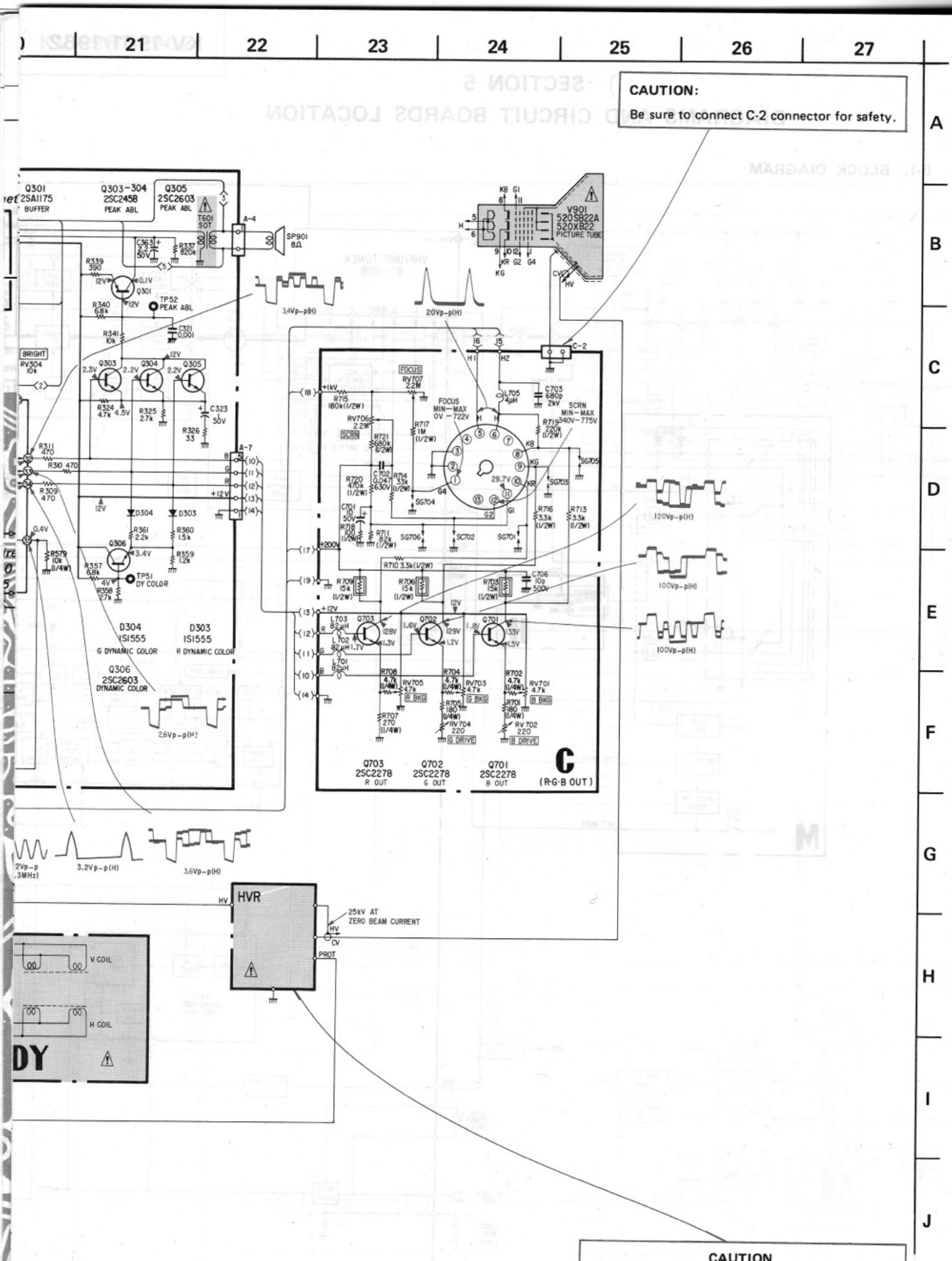
This set is equipped with a polarized AC power cord plug (c
of the plug is wider than the other), be sure to use it h
specified part number and connect it as shown in this diagra



one blade
aving the
m.

CAUTION:
When taking a broken fuse (F602) off, discharge across C602 to avoid shock hazard.

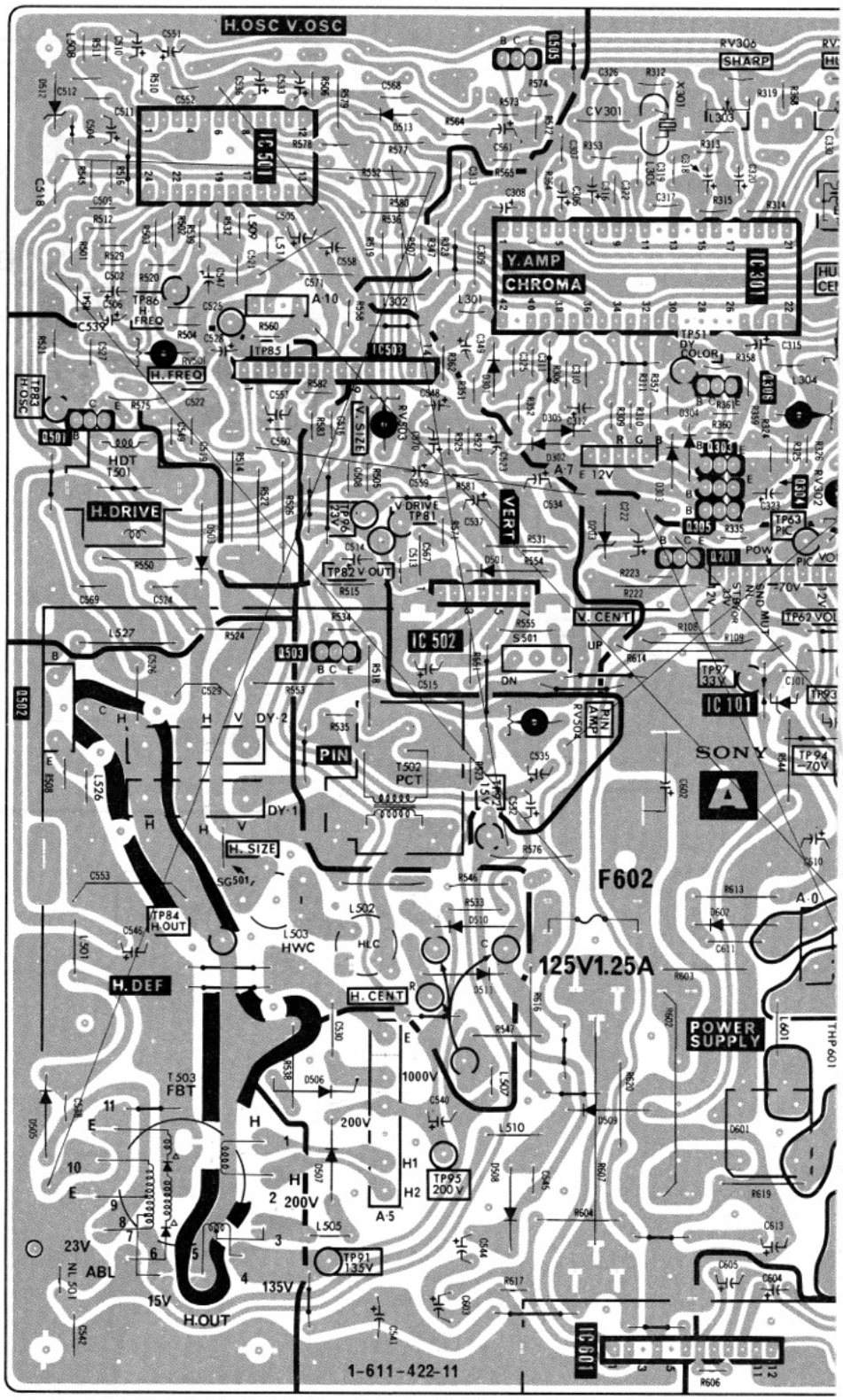

13
14
15
16
17
18
19
20
IC 302
CX841A
DYNAMIC PICTURE
Q307
2SC2785
BUFFER
D301,302
1S1555
DYNAMIC APACON
IC301
CX848
Y, CHROMA
Q301
2SA1175
BUFFER
D509
GP08D
-70V RECT
SUB CONTRAST
HUE CENT
PEDESTAL CLAMP
AUTO PEDESTAL
PRE-EMPHASIS
GAIN CTL
PULSE SHAPE
SW
PICTURE
SUB BRT
COLOR
SHARPNESS
BRIGHT
HUE
ACC
SHARP CTL
PIX CTL
CLAMP
BRIGHT CTL
AUTO/MANUAL CTL
R.G.B MATRIX
BLK
BUFF AMP
KILLER DET
HUE/COLOR CTL
DEMOD
ACC AMP
ACC DET
BURST FLAG
1/4 FIRST DEVIDE
14.3MHz OSC
APC DET
VOL CONT
VIDEO OUT
DC AMP
Q201
2SD789
+12V REG
D203
RD13E-B2Z
+12V ZENER
D305
1S1555
ABL CLAMP
Q505
2SA733
SYNC INVERT
COLOR SYNC
V DRIVE
V OUT
PIN AMP
V CENT
H PCT
H CENT
SG501
H DRIVE
PIN CORRECT
V BOOST
V OUT
H CENT-1,2
H OUT
+23V RECT
+15V RECT
+200V RECT
G2 RECT
HOLD DOWN CHECK POINT Ⓐ
DY
DY-1
DY-2
A-5
A-10
HV
FBT
: See page 15, 16.


21
22
23
24
25
26
27
A
B
C
D
E
F
G
H
I
J
CAUTION:
Be sure to connect C-2 connector for safety.
Q301
2SA1175
BUFFER
Q303-304
2SC2458
PEAK ABL
Q305
2SC2603
PEAK ABL
T601
SOT
SP901
8Ω
V901
520SB22A
520XB22
PICTURE TUBE
TP52
PEAK ABL
BRIGHT
RV304
10k
3.4Vp-p(H)
20Vp-p(H)
FOCUS
RV707
2.2M
FOCUS
MIN—MAX
0V—722V
SCRN
MIN—MAX
340V—775V
C-2
+1kV
+200V
+12V
D304
1SI555
G DYNAMIC COLOR
D303
1SI555
R DYNAMIC COLOR
Q306
2SC2603
DYNAMIC COLOR
TP51
DY COLOR
2.6Vp-p(H)
120Vp-p(H)
100Vp-p(H)
100Vp-p(H)
2Vp-p
3.3MHz)
3.2Vp-p(H)
3.6Vp-p(H)
Q703
2SC2278
R OUT
Q702
2SC2278
G OUT
Q701
2SC2278
B OUT
(R·G·B OUT)
R BKG
G BKG
B BKG
R DRIVE
G DRIVE
B DRIVE
HVR
25kV AT
ZERO BEAM CURRENT
V COIL
H COIL
DY
CAUTION
When replacing HVR, be sure to check the HOLD DOWN check point voltage value. Refer to the Safety Adjustment Section.

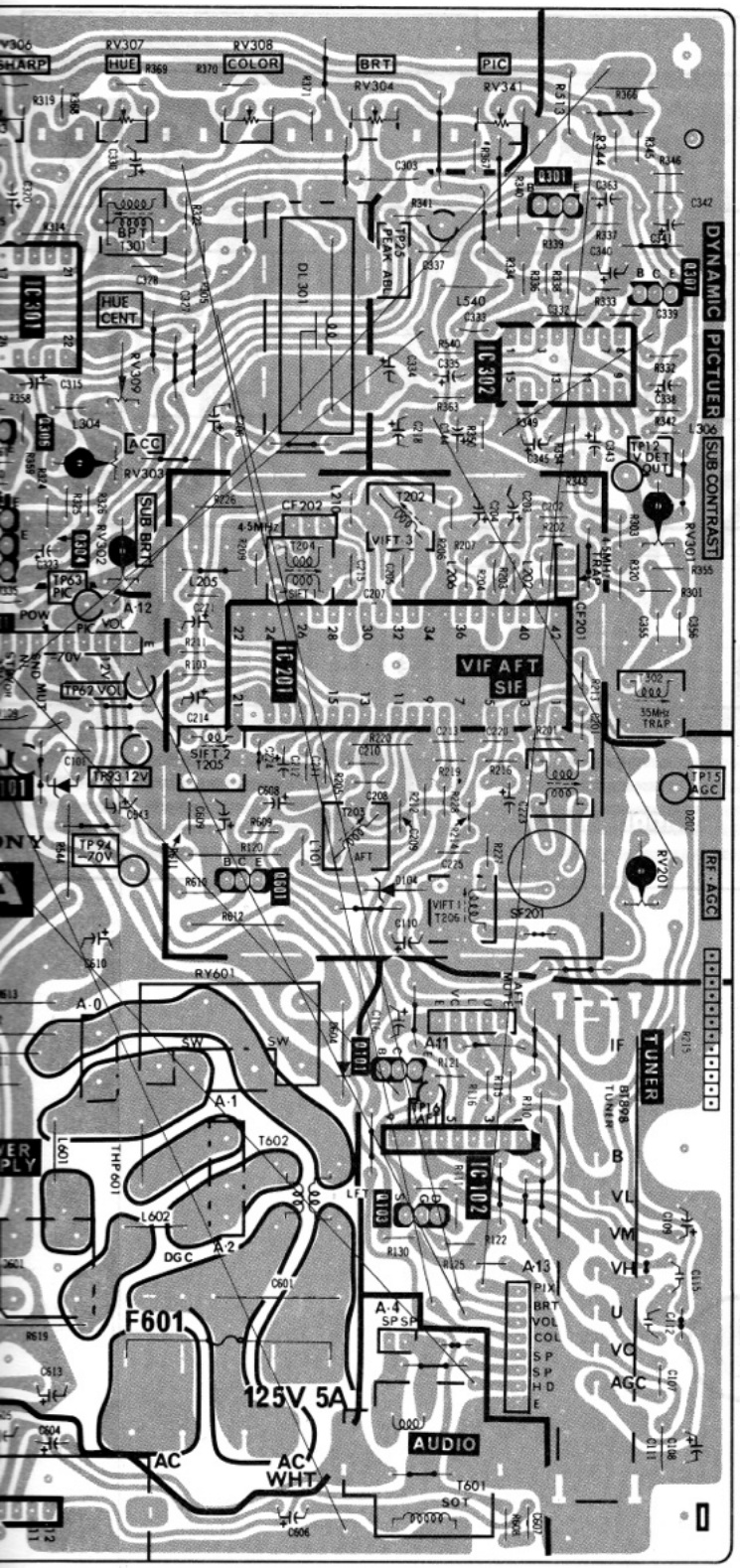
5-4. PRINTED WIRING BOARD

– Conductor Side –

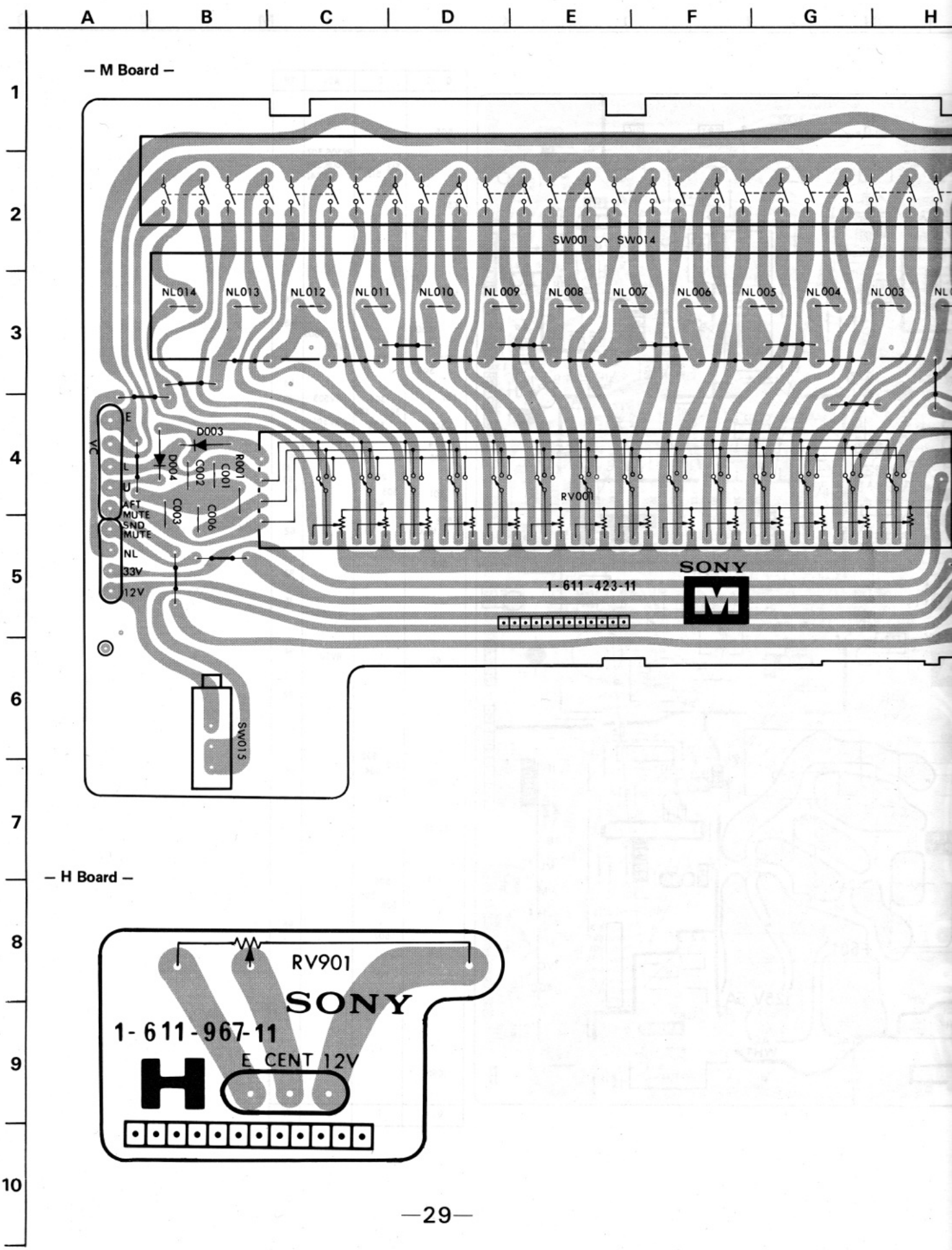
– A Board –



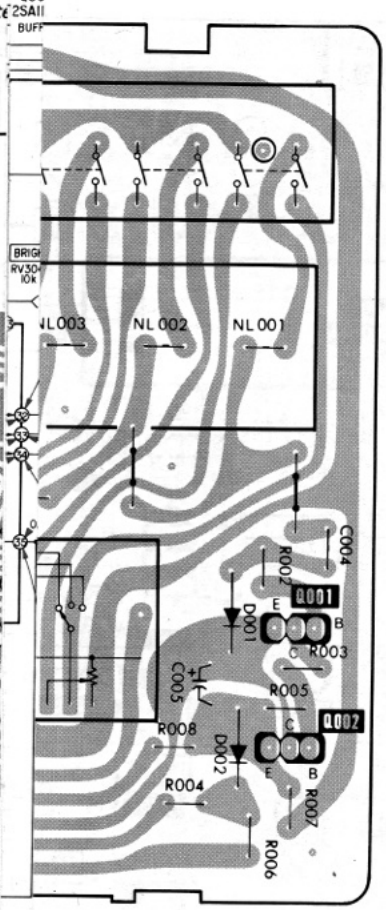
H I J K L M N O

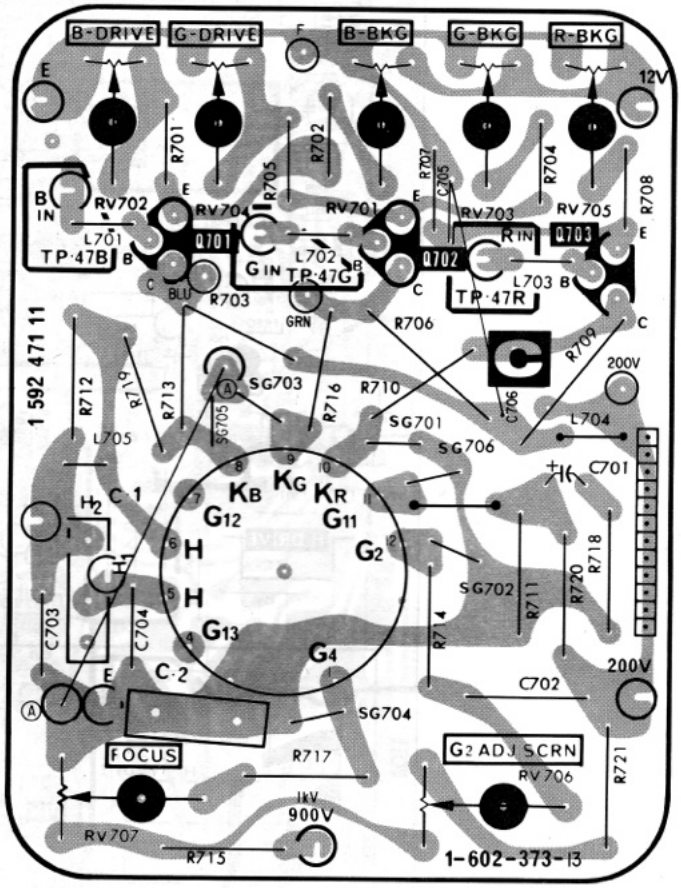


Q . IC	D	ADJ	TP
505			
	512 513	RV306,307 RV308,304 RV341	
IC501			
301			25
307			
IC301			86
IC302		RV309	85
IC503	301	RV501	51
306			83
501	305	RV503	12
	302 304		
303	303	RV301	
304			
305			96
	203		81
201	503		63
	501		82
IC502			
IC201			62
503			93
			15
		RV504	
601		RV201	94
	104		
			92
	602		
	510 604		84
101			
	511		16
IC102			
103	506		
	509		
	505		
	507		95
	508		
			91
IC601			
Q . IC	D	ADJ	TP


A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8
9
10
– M Board –
SW001 ~ SW014
NL014
NL013
NL012
NL011
NL010
NL009
NL008
NL007
NL006
NL005
NL004
NL003
CN
E
L
U
AFT
MUTE
SND
MUTE
NL
33V
12V
D003
D004
C002
C001
R001
C003
C004
RV001
SONY
1-611-423-11
M
SW015
– H Board –
RV901
SONY
1-611-967-11
E CENT 12V
H

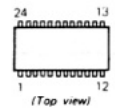
– C Board –


NL003
NL002
NL001
Q001
Q002
D001
D002
R002
R003
R004
R005
R006
R007
R008
C004
C005

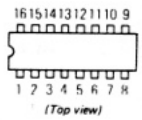

B-DRIVE
G-DRIVE
B-BKG
G-BKG
R-BKG
12V
B IN
G IN
R IN
RV701
RV702
RV703
RV704
RV705
Q701
Q702
Q703
L701
L702
L703
L704
L705
TP·47B
TP·47G
TP·47R
R701
R702
R703
R704
R705
R706
R707
R708
R709
R710
R712
R713
R716
C701
C702
C703
C704
C705
C706
SG701
SG702
SG703
SG704
SG705
SG706
200V
FOCUS
G2 ADJ SCRN
RV706
RV707
R715
R717
R718
R720
R721
1kV
900V
1 592 471 11
1-602-373-13

5-5. SEMICONDUCTORS

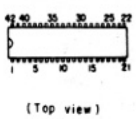
CX-20013A



CX-841A

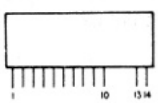


CX-848
CX-885B

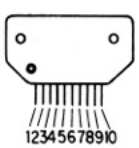


LA7920

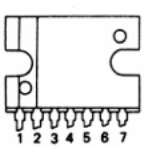
PM-3



STK-563F



μPC1378H-L



μPC574J-G

2SA1015
2SA733
2SC1815
2SC945
JC501

2SA1026

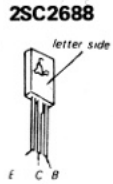
2SA1048
2SA1115
2SC2458
2SC2603

2SA1175
2SC2785

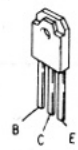
2SC2278

2SC2610BK
2SD789

2SC2688



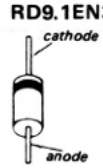
2SD1398



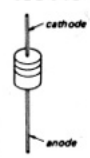
2SD774

2SK381-E

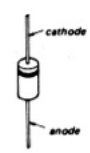
1S1555
1S2076
1S2473
1SS133
RD13EB2
RD6.8JN3
RD9.1EN3



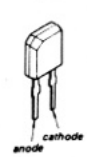
1SS119
1SS148



GP08D

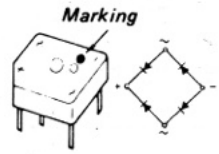


PH302B

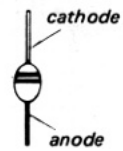


RH-1A

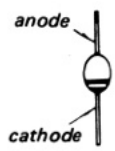
S3WB60Z



U05E
U05G

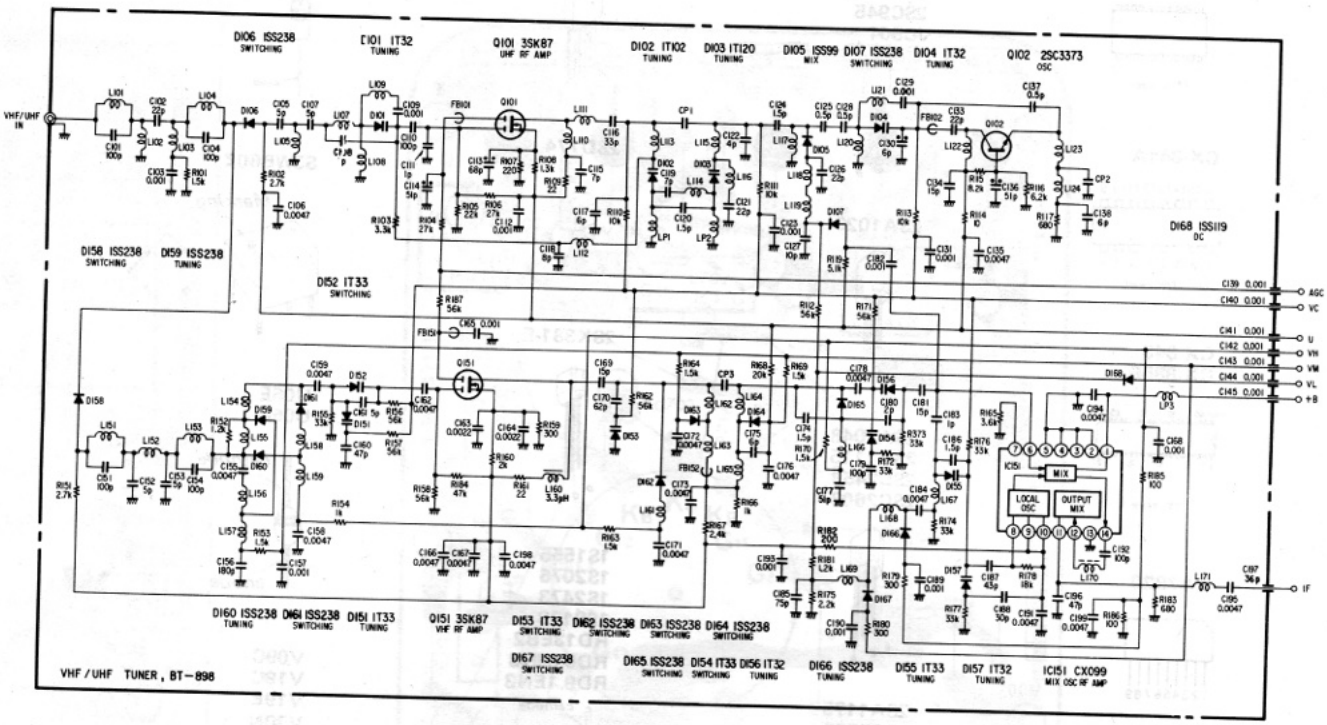


V09C
V19C
V19E
V30N



5-6. UHF/VHF TUNER SCHEMATIC DIAGRAM

- **BT-898**



Note: Tuner reference numbers are not included in the Electrical Parts List.

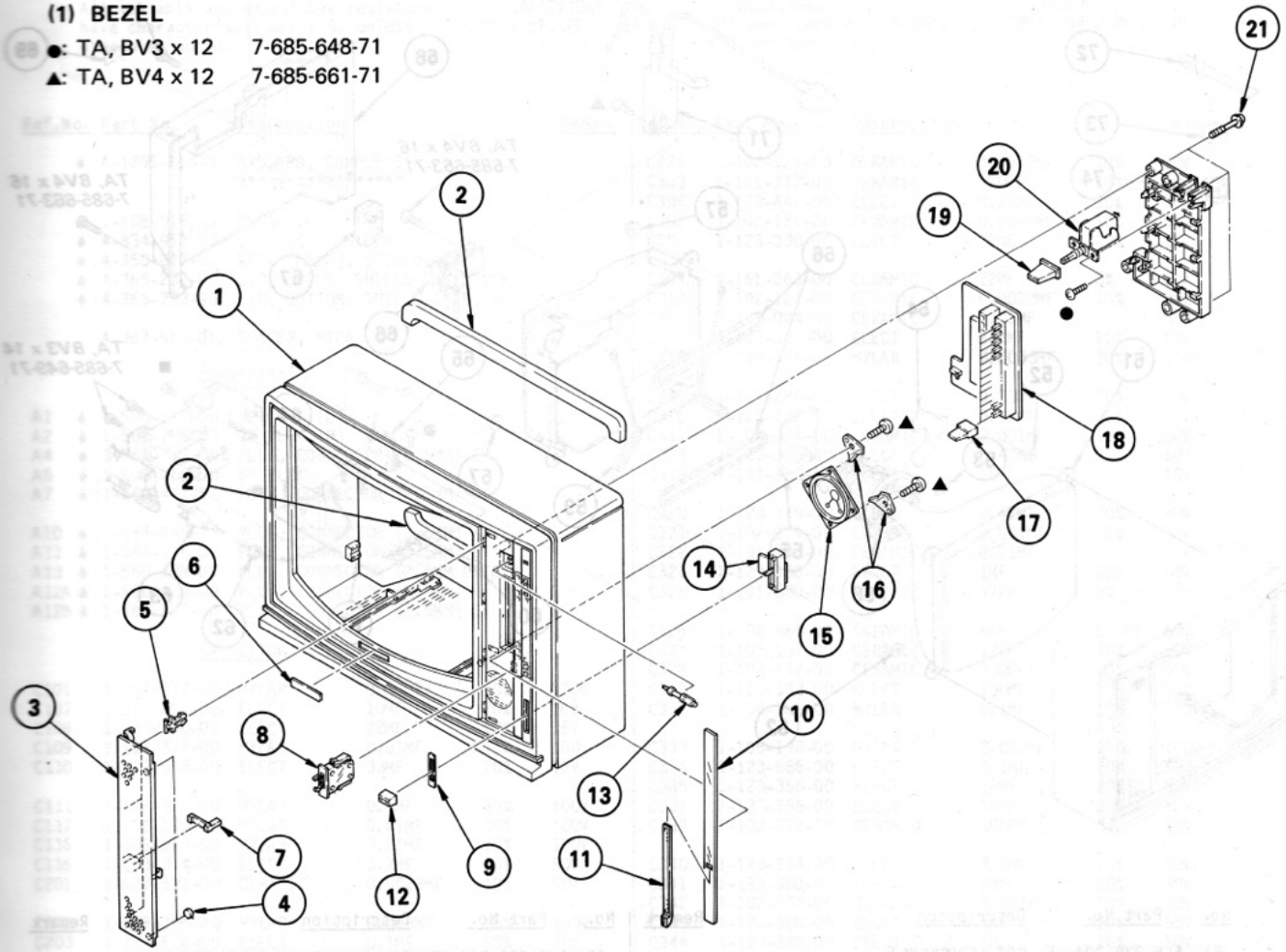
SECTION 6
EXPLODED VIEWS

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

(1) BEZEL

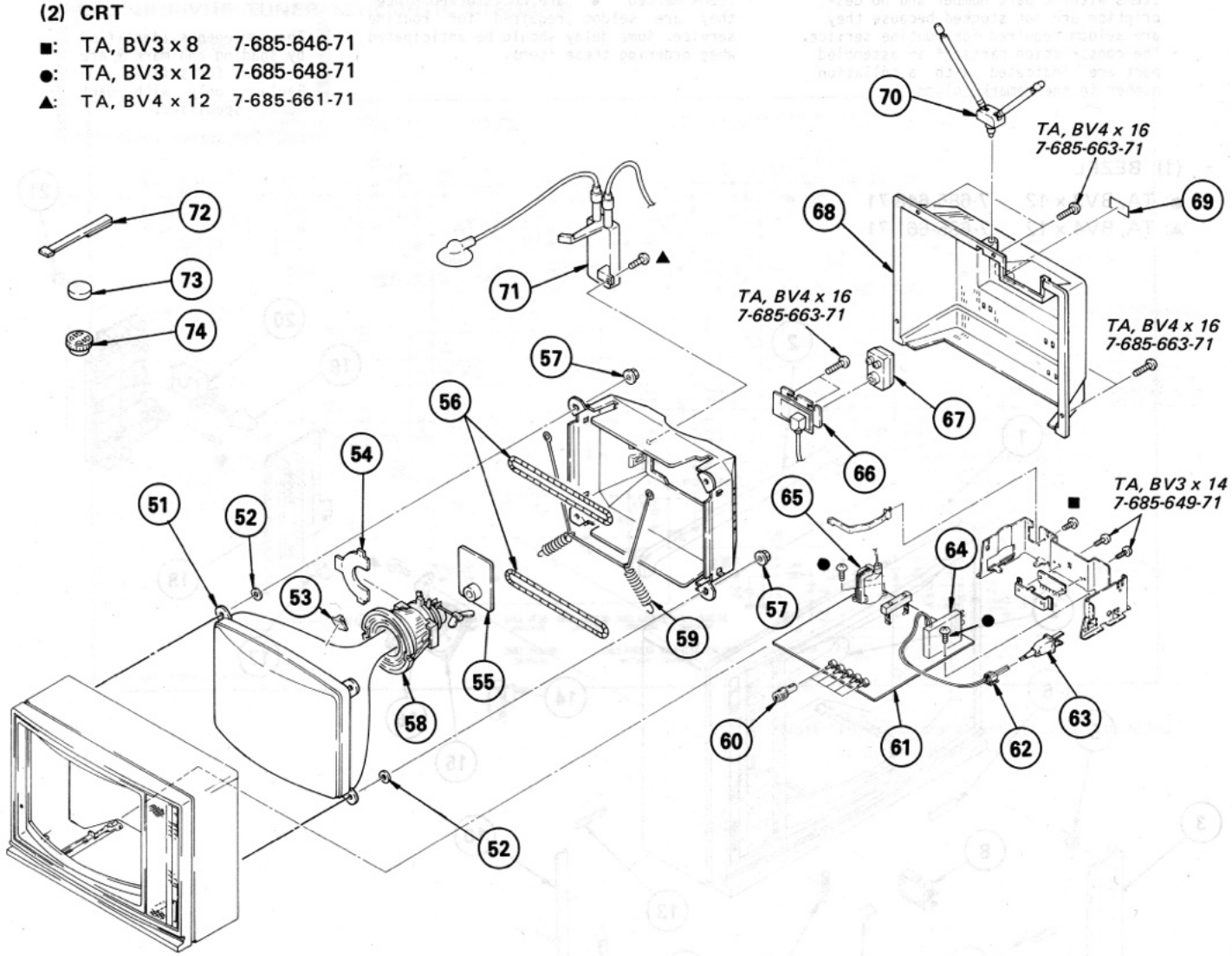
●: TA, BV3 x 12 7-685-648-71
▲: TA, BV4 x 12 7-685-661-71



No.	Part No.	Description	Remark
1	A-1008-277-A	BEZEL ASSY (KV-1961)	2,3,5,6,7
	A-1008-278-A	BEZEL ASSY (KV-1962)	8,9,10
2	4-312-539-00	CUSHION (A), BEZEL	
3	X-4365-103-2	DOOR ASSY, CONTROL (KV-1961)	4
	X-4365-104-3	DOOR ASSY, CONTROL (KV-1962)	
4	4-330-313-00	CUSHION	
5	3-703-035-11	SHAFT, LID	
6	3-703-829-01	EMBLEM (LARGE), SONY	
7	4-365-105-00	KNOB, AFT	
8	4-352-034-00	CATCHER, PUSH	
9	♦:4-365-101-00	PLATE, ORNAMENTAL, CONTROL	
10	♦:X-4365-101-5	WINDOW ASSY, CHANNEL	
11	X-4365-202-0	HOLDER ASSY, LABEL	
12	4-340-933-11	KNOB, SLIDE CONTROL (KV-1961)	
	4-340-933-00	KNOB, SLIDE CONTROL (KV-1962)	
13	4-365-250-00	SCREWDRIVER, PRESET	
14	♦:1-611-976-11	H BOARD	
15	1-502-766-00	SPEAKER	
16	♦:4-338-106-00	HOLDER, SPEAKER	
17	4-365-110-01	BUTTON, SELECTOR (KV-1961)	
	4-365-110-11	BUTTON, SELECTOR (KV-1962)	
18	♦:1-611-423-11	M BOARD	
19	4-365-109-01	BUTTON, POWER (KV-1961)	
	4-365-109-11	BUTTON, POWER (KV-1962)	
20	⚠.1-552-658-41	SWITCH, PUSH	
21	4-319-520-00	SCREW, SPECIAL (+PW4X30)	

(2) CRT

■: TA, BV3 x 8 7-685-646-71
●: TA, BV3 x 12 7-685-648-71
▲: TA, BV4 x 12 7-685-661-71



No.	Part No.	Description	Remark
51	⚠.8-738-706-05	CRT (520SB22A)	
52	4-348-567-00	WASHER, CRT POSITION	
53	3-703-003-00	SPACER, DY	
54	1-452-146-00	MAGNET, BMC	
55	♦:A-1330-487-A	C BOARD, COMPLETE	
56	⚠.1-425-901-22	COIL, ERASE	
57	4-306-034-00	FLANGE NUT, (B) 5MM	
58	⚠.1-451-182-31	DEFLECTION YOKE (SY108A)	
59	4-303-774-XX	SPRING	
60	4-365-226-01	KNOB, VR	
61	♦:A-1295-816-A	A BOARD, COMPLETE	
62	⚠.4-022-115-01	HOLDER, AC CORD	
63	⚠.1-557-269-11	CORD, POWER	
64	⚠.1-463-522-11	TUNER, ET (BT-898)	

No.	Part No.	Description	Remark
65	⚠.1-439-254-12	TRANSFORMER ASSY, FLYBACK	
66	⚠.1-536-830-11	TERMINAL BOARD ASSY, ANTENNA	
67	⚠.1-562-443-11	CONNECTOR, ANTENNA (EAC-31)	
68	4-365-115-02	COVER, BACK	
69	♦:4-365-153-01	LABEL, MODEL NUMBER (KV-1961)	
	♦:4-365-152-01	LABEL, MODEL NUMBER (KV-1962)	
70	1-501-276-00	ANTENNA, TELESCOPIC (AN-18)	
71	⚠.1-228-482-24	RESISTOR ASSY, HIGH-VOLTAGE	
72	X-4309-608-0	PERMALLOY ASSY, CONVERGENCE	
73	1-452-032-00	MAGNET, DISK; 10MM ϕ	
74	1-452-094-00	MAGNET, ROTATABLE DISK; 15MM ϕ	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

A

SECTION 7
ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

• Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

• All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

CAPACITORS
• MF : μF, PF : μμF

RESISTORS
• All resistors are in ohms
• F : nonflammable

COILS
• MMH : mH, UH : μH

Ref.No.	Part No.	Description			Remark
	♦:A-1295-816-A	A BOARD, COMPLETE			
		**********			
	♦:1-508-915-11	PLUG, 1P			
	♦:4-334-952-00	CASE (C), SHIELD			
	♦:4-350-807-00	CASE (MAIN), SHIELD, VIF			
	♦:4-365-232-00	LID, UPPER, SHIELD CASE, VIF			
	♦:4-365-233-00	LID, BOTTOM, SHIELD CASE, VIF			
	4-367-513-00	SPACER, MICA			
		CONNECTOR			
A1	♦:1-506-371-00	2P PLUG (L)			
A2	♦:1-508-765-00	3P PLUG (M)			
A4	♦:1-564-353-00	PLUG, CONNECTOR (2.5MM) 2P			
A5	♦:1-508-768-00	6P PLUG			
A7	♦:1-564-441-11	PLUG, CONNECTOR (2.5MM) 5P			
A10	♦:1-564-440-11	PLUG, CONNECTOR (2.5MM) 4P			
A11	♦:1-560-125-00	PLUG, CONNECTOR (2.5MM) 5P			
A13	♦:1-560-128-00	PLUG, CONNECTOR (2.5MM PITCH)			
A12A	♦:1-560-124-00	PLUG, CONNECTOR (2.5MM) 4P			
A12B	♦:1-560-123-00	PLUG, CONNECTOR (2.5MM) 3P			
		CAPACITOR			
C101	1-108-377-00	MYLAR	0.01MF	10%	100V
C107	1-123-356-00	ELECT	10MF	20%	16V
C108	1-123-330-00	ELECT	22MF	20%	16V
C109	1-108-377-00	MYLAR	0.01MF	10%	100V
C110	1-123-318-00	ELECT	33MF	20%	16V
C111	1-108-389-00	MYLAR	0.1MF	10%	100V
C112	1-108-377-00	MYLAR	0.01MF	10%	100V
C115	1-108-377-00	MYLAR	0.01MF	10%	100V
C116	1-123-354-00	ELECT	3.3MF	20%	50V
C201	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C202	1-108-380-00	MYLAR	0.018MF	10%	100V
C203	1-123-586-00	ELECT	0.1MF	20%	50V
C204	1-123-447-00	ELECT	0.22MF	20%	50V
C205	1-102-525-00	CERAMIC	68PF	5%	50V
C206	1-123-324-00	ELECT	1000MF	20%	16V
C207	1-101-004-00	CERAMIC	0.01MF		50V
C208	1-102-510-00	CERAMIC	12PF	5%	50V
C209	1-102-494-00	CERAMIC	68PF	5%	50V
C210	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C211	1-108-380-00	MYLAR	0.018MF	10%	100V
C212	1-123-286-00	ELECT	0.33MF	20%	50V
C213	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C214	1-123-356-00	ELECT	10MF	20%	16V
C215	1-101-006-00	CERAMIC	0.047MF		50V
C218	1-123-333-00	ELECT	100MF	20%	16V
C220	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C221	1-123-356-00	ELECT	10MF	20%	16V
C222	1-123-332-00	ELECT	47MF	20%	16V
C223	1-123-380-00	ELECT	1MF	20%	50V
C224	1-101-004-00	CERAMIC	0.01MF		50V

Ref.No.	Part No.	Description			Remark
C225	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C303	1-161-313-00	CERAMIC	150PF	10%	50V
C306	1-123-447-00	ELECT	0.22MF	20%	50V
C307	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C308	1-123-330-00	ELECT	22MF	20%	16V
C309	1-161-263-00	CERAMIC	22PF	5%	50V
C310	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C311	1-101-004-00	CERAMIC	0.01MF		50V
C312	1-123-381-00	ELECT	2.2MF	20%	50V
C313	1-108-371-00	MYLAR	0.0033MF	10%	100V
C315	1-123-286-00	ELECT	0.33MF	20%	50V
C316	1-123-447-00	ELECT	0.22MF	20%	50V
C317	1-102-074-00	CERAMIC	0.001MF	10%	50V
C318	1-123-379-00	ELECT	0.47MF	20%	50V
C319	1-121-259-51	ELECT	10MF		16V
C320	1-123-379-00	ELECT	0.47MF	20%	50V
C321	1-102-074-00	CERAMIC	0.001MF	10%	50V
C322	1-101-004-00	CERAMIC	0.01MF		50V
C323	1-123-380-00	ELECT	1MF	20%	50V
C325	1-101-880-00	CERAMIC	47PF	5%	50V
C326	1-102-865-00	CERAMIC	8PF	0.5PF	50V
C327	1-102-107-00	CERAMIC	120PF	10%	50V
C328	1-102-112-00	CERAMIC	330PF	10%	50V
C330	1-123-333-00	ELECT	100MF	20%	16V
C332	1-108-389-00	MYLAR	0.1MF	10%	100V
C333	1-106-198-00	MYLAR	0.012MF	10%	100V
C334	1-123-586-00	ELECT	0.1MF	20%	50V
C335	1-123-356-00	ELECT	10MF	20%	50V
C338	1-123-356-00	ELECT	10MF	20%	16V
C339	1-102-973-00	CERAMIC	100PF	5%	50V
C340	1-123-354-00	ELECT	3.3MF	20%	50V
C341	1-123-380-00	ELECT	1MF	20%	50V
C342	1-102-074-00	CERAMIC	0.001MF	10%	50V
C343	1-123-380-00	ELECT	1MF	20%	50V
C344	1-123-380-00	ELECT	1MF	20%	50V
C345	1-123-318-00	ELECT	33MF	20%	16V
C349	1-123-332-00	ELECT	47MF	20%	16V
C355	1-102-858-00	CERAMIC	10PF	0.5PF	50V
C356	1-102-858-00	CERAMIC	10PF	0.5PF	50V
C363	1-123-381-00	ELECT	2.2MF	20%	50V
C502	1-108-384-00	MYLAR	0.039MF	10%	100V
C504	1-123-380-00	ELECT	1MF	20%	50V
C505	1-123-330-00	ELECT	22MF	20%	16V
C506	1-123-328-00	ELECT	4.7MF	20%	25V
C508	1-108-371-00	MYLAR	0.0033MF	10%	100V
C509	1-102-922-00	CERAMIC	110PF	5%	50V
C510	1-123-586-00	ELECT	0.1MF	20%	50V
C511	1-108-367-00	MYLAR	0.0015MF	10%	100V
C512	1-108-369-00	MYLAR	0.0022MF	10%	100V
C513	1-102-244-00	CERAMIC	220PF	10%	500V
C514	1-123-380-00	ELECT	1MF	20%	50V
C515	1-123-345-00	ELECT	100MF	20%	35V
C516	1-121-259-51	ELECT	10MF		16V

Ref.No.	Part No.	Description			Remark
C518	1-108-373-00	MYLAR	0.0047MF	10%	100V
C519	1-108-689-11	MYLAR	0.0056MF	10%	200V
C521	1-102-074-00	CERAMIC	0.001MF	10%	50V
C522	1-102-030-00	CERAMIC	330PF	10%	500V
C523	1-123-584-00	ELECT	22MF	10%	16V
C524	1-102-212-00	CERAMIC	820PF	10%	500V
C525	1-102-527-00	CERAMIC	82PF	5%	50V
C526	1-162-115-00	CERAMIC	330PF	10%	2KV
C527	1-108-383-00	MYLAR	0.033MF	10%	100V
C528	1-131-351-00	TANTALUM	4.7MF	20%	35V
C529	1-136-052-00	FILM	0.3MF	5%	400V
C530	1-102-223-00	CERAMIC	0.0047MF	10%	2KV
C532	1-123-003-00	ELECT	1MF		250V
C533	1-131-498-00	TANTALUM	1MF	10%	25V
C534	1-123-587-00	ELECT	560MF	10%	25V
C535	1-123-330-00	ELECT	22MF	20%	25V
C536	1-123-321-00	ELECT	220MF	20%	16V
C537	1-123-344-00	ELECT	47MF	20%	35V
C538	1-102-212-00	CERAMIC	820PF	10%	500V
C539	1-123-379-00	ELECT	0.47MF	20%	50V
C540	1-121-999-00	ELECT	10MF		160V
C541	1-123-024-00	ELECT	33MF		160V
C542	1-108-429-00	MYLAR	0.047MF	10%	200V
C543	1-123-252-00	ELECT	1MF		160V
C544	1-123-335-00	ELECT	330MF	20%	25V
C545	1-102-212-00	CERAMIC	820PF	10%	500V
C546	1-123-346-00	ELECT	220MF	20%	35V
C547	1-123-357-00	ELECT	22MF	20%	50V
C548	1-123-379-00	ELECT	0.47MF	20%	50V
C549	1-101-004-00	CERAMIC	0.01MF		50V
C551	1-123-380-00	ELECT	1MF	20%	50V
C552	1-108-382-00	MYLAR	0.027MF	10%	100V
C553 ⚠	1-130-912-11	FILM	0.0094MF	3%	1.2KV
C557	1-123-357-00	ELECT	22MF	20%	50V
C558	1-123-356-00	ELECT	10MF	20%	16V
C559	1-123-381-00	ELECT	2.2MF	20%	50V
C560	1-102-030-00	CERAMIC	330PF	10%	500V
C561	1-123-330-00	ELECT	22MF	20%	16V
C567	1-108-387-00	MYLAR	0.068MF	10%	100V
C568	1-108-385-00	MYLAR	0.047MF	10%	100V
C569	1-106-198-00	MYLAR	0.012MF	10%	100V
C570	1-123-380-00	ELECT	1MF	20%	50V
C601	1-108-745-00	MYLAR	0.22MF	20%	125V
C602	1-125-215-00	ELECT(BLOCK)	560MF		200V
C603	1-121-999-00	ELECT	10MF		160V
C604	1-123-358-00	ELECT	33MF	20%	50V
C606	1-123-252-00	ELECT	1MF		160V
C607	1-108-371-00	MYLAR	0.0033MF	10%	100V
C608	1-123-381-00	ELECT	2.2MF	20%	50V
C613	1-121-999-00	ELECT	10MF		160V

FILTER

CF201	1-409-332-00	CERAMIC TRAP (4.5MHZ)	
CF202	1-527-260-00	FILTER, CERAMIC (4.5MHZ)	

TRIMMER

CV301	1-141-147-XX	CAP, TRIMMER	

DIODE

D104	8-719-102-88	DIODE RD9.1E-N3	
D203	8-719-100-68	DIODE RD13E-B2	
D301	8-719-911-19	DIODE 1SS119	
D302	8-719-911-19	DIODE 1SS119	
D303	8-719-911-19	DIODE 1SS119	
D304	8-719-911-19	DIODE 1SS119	
D305	8-719-911-19	DIODE 1SS119	
D501	8-719-908-03	DIODE GP08D	
D503	8-719-903-09	DIODE V30N	
D505	8-719-901-93	DIODE V19E	
D506	8-719-903-09	DIODE V30N	
D507	8-719-300-76	DIODE RH-1A	
D508	8-719-901-93	DIODE V19E	
D509	8-719-908-03	DIODE GP08D	
D510	8-719-908-03	DIODE GP08D	
D511	8-719-908-03	DIODE GP08D	
D513	8-719-911-19	DIODE 1SS119	
D601	8-719-503-06	DIODE S3WB60Z	

DELAY LINE

DL301	1-415-176-00	DELAY LINE	

CONNECTOR

DY1	♦:1-506-348-XX	3P PLUG (L)	
DY2	♦:1-506-348-XX	3P PLUG (L)	

FUSE

F601 ⚠	1-532-221-11	FUSE	
	1-533-127-00	FUSE CLIP, F601	
F602 ⚠	1-532-570-11	FUSE, GLASS TUBE	
	♦:1-533-146-00	HOLDER, FUSE, F602	

IC

IC101	8-759-157-41	IC UPC574J-G	
IC102	8-759-800-12	IC LA7920	
IC201	8-758-852-00	IC CX885B	
IC301	8-758-480-00	IC CX848	
IC302	8-759-905-15	IC CX841A	
IC501	8-752-001-31	IC CX20013A	
IC502	8-759-113-78	IC UPC1378H-L	
IC503 ⚠	1-235-217-11	MODULE (PM-3)	
IC601 ⚠	8-749-956-30	IC STK563F	

COIL

L101	1-408-408-00	MICRO INDUCTOR 8.2UH	
L202	1-408-412-00	MICRO INDUCTOR 18UH	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No.	Part No.	Description	Remark
L205	1-408-408-00	MICRO INDUCTOR 8.2UH	
L206	1-408-403-00	MICRO INDUCTOR 3.3UH	
L210	1-408-403-00	MICRO INDUCTOR 3.3UH	
L301	1-408-416-00	MICRO INDUCTOR 39UH	
L302	1-408-163-00	MICRO INDUCTOR 5.6MMH	
L303	1-408-398-00	MICRO INDUCTOR 1.2UH	
L304	1-408-398-00	MICRO INDUCTOR 1.2UH	
L305	1-408-398-00	MICRO INDUCTOR 1.2UH	
L501	1-408-348-00	MICRO INDUCTOR 39UH	
L502	1-459-316-00	COIL, FERRITE (HLC)	
L503 ⚠	1-459-315-11	COIL, VAR, FERRITE (HWC)	
L505	1-407-705-00	MICRO INDUCTOR 100UH	
L507	1-407-501-00	MICRO INDUCTOR 5.6MMH	
L508	1-408-427-00	MICRO INDUCTOR 330UH	
L509	1-408-400-00	MICRO INDUCTOR 1.8UH	
L510	1-408-348-00	MICRO INDUCTOR 39UH	
L511	1-407-178-XX	MICRO INDUCTOR 1UH	
L526	1-407-365-00	COIL, CHOKE (HIGH FREQUENCY)	
L527	1-407-364-00	COIL, SPOOK CHOKE	
L540	1-408-247-00	MICRO INDUCTOR 33MMH	
L601 ⚠	1-408-225-11	MICRO INDUCTOR 3.3UH	
L602 ⚠	1-408-225-11	MICRO INDUCTOR 3.3UH	

NEON LAMP

NL501	1-519-237-11	LAMP, NEON	

TRANSISTOR

Q101	8-729-245-83	TRANSISTOR 2SC2458	
Q103	8-729-600-08	TRANSISTOR 2SK381-E	
Q201	8-729-177-43	TRANSISTOR 2SD774	
Q301	8-729-204-83	TRANSISTOR 2SA1048GR	
Q303	8-729-245-83	TRANSISTOR 2SC2458	
Q304	8-729-245-83	TRANSISTOR 2SC2458	
Q305	8-729-245-83	TRANSISTOR 2SC2458	
Q306	8-729-245-83	TRANSISTOR 2SC2458	
Q307	8-729-245-83	TRANSISTOR 2SC2458	
Q501	8-729-168-82	TRANSISTOR 2SC2688	
Q502	8-729-201-98	TRANSISTOR 2SD1427-LB	
Q503	8-729-177-43	TRANSISTOR 2SD774	
Q505	8-729-204-83	TRANSISTOR 2SA1048GR	

RESISTOR

R108	1-246-511-00	CARBON	39K	5%	1/4W	
R109	1-206-690-00	METAL OXIDE	12K	5%	2W	F
R110	1-247-871-00	CARBON	47K	5%	1/6W	
R111	1-247-888-00	CARBON	240K	5%	1/6W	
R112	1-210-819-00	SOLID	1.8M	5%	1/4W	
R115	1-247-839-00	CARBON	2.2K	5%	1/6W	
R116	1-247-839-00	CARBON	2.2K	5%	1/6W	
R120	1-244-841-51	CARBON	47	5%	1/2W	
R121	1-247-855-00	CARBON	10K	5%	1/6W	
R122	1-247-903-00	CARBON	1M	5%	1/6W	
R125	1-247-852-00	CARBON	7.5K	5%	1/6W	
R130	1-247-874-00	CARBON	62K	5%	1/6W	
R201	1-247-845-00	CARBON	3.9K	5%	1/6W	
R202	1-247-879-00	CARBON	100K	5%	1/6W	
R203	1-247-869-00	CARBON	39K	5%	1/6W	
R204	1-247-833-00	CARBON	1.2K	5%	1/6W	
R205	1-247-831-00	CARBON	1K	5%	1/6W	
R206	1-247-891-00	CARBON	330K	5%	1/6W	
R207	1-247-819-00	CARBON	330	5%	1/6W	
R209	1-247-831-00	CARBON	1K	5%	1/6W	
R211	1-247-839-00	CARBON	2.2K	5%	1/6W	
R212	1-247-831-00	CARBON	1K	5%	1/6W	
R213	1-247-846-00	CARBON	4.3K	5%	1/6W	
R214	1-247-838-00	CARBON	2K	5%	1/6W	
R215	1-247-864-00	CARBON	24K	5%	1/6W	
R216	1-247-843-00	CARBON	3.3K	5%	1/6W	
R219	1-247-873-00	CARBON	56K	5%	1/6W	
R220	1-246-513-00	CARBON	47K	5%	1/4W	
R222	1-213-124-00	METAL OXIDE	27	5%	1W	F
R223	1-247-831-00	CARBON	1K	5%	1/6W	
R226	1-247-807-00	CARBON	100	5%	1/8W	F
R227	1-247-839-00	CARBON	2.2K	5%	1/6W	
R228	1-247-831-00	CARBON	1K	5%	1/6W	
R301	1-247-831-00	CARBON	1K	5%	1/6W	
R303	1-247-873-00	CARBON	56K	5%	1/6W	
R305	1-247-827-00	CARBON	680	5%	1/6W	
R306	1-247-855-00	CARBON	10K	5%	1/6W	
R309	1-247-823-00	CARBON	470	5%	1/6W	
R310	1-247-823-00	CARBON	470	5%	1/6W	
R311	1-247-823-00	CARBON	470	5%	1/6W	
R312	1-247-821-00	CARBON	390	5%	1/6W	
R313	1-247-829-00	CARBON	820	5%	1/6W	
R314	1-246-505-00	CARBON	22K	5%	1/4W	
R315	1-247-863-00	CARBON	22K	5%	1/6W	
R319	1-247-843-00	CARBON	3.3K	5%	1/6W	
R320	1-247-863-00	CARBON	22K	5%	1/6W	
R322	1-247-801-00	CARBON	56	5%	1/6W	
R323	1-246-473-00	CARBON	1K	5%	1/4W	
R324	1-247-847-00	CARBON	4.7K	5%	1/6W	
R325	1-247-841-00	CARBON	2.7K	5%	1/6W	
R326	1-247-795-00	CARBON	33	5%	1/6W	
R333	1-247-851-00	CARBON	6.8K	5%	1/6W	
R334	1-247-855-00	CARBON	10K	5%	1/6W	
R335	1-247-850-00	CARBON	6.2K	5%	1/6W	
R336	1-247-839-00	CARBON	2.2K	5%	1/6W	
R337	1-247-901-00	CARBON	820K	5%	1/6W	
R338	1-247-851-00	CARBON	6.8K	5%	1/6W	
R339	1-247-821-00	CARBON	390	5%	1/6W	
R340	1-247-851-00	CARBON	6.8K	5%	1/6W	
R341	1-247-855-00	CARBON	10K	5%	1/6W	
R342	1-247-821-00	CARBON	390	5%	1/6W	
R344	1-247-871-00	CARBON	47K	5%	1/6W	
R345	1-247-861-00	CARBON	18K	5%	1/6W	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No.	Part No.	Description				Remark
R346	1-247-861-00	CARBON	18K	5%	1/6W	
R347	1-247-855-00	CARBON	10K	5%	1/6W	
R348	1-247-853-00	CARBON	8.2K	5%	1/6W	
R349	1-247-877-00	CARBON	82K	5%	1/6W	
R350	1-247-901-00	CARBON	820K	5%	1/6W	
R351	1-247-843-00	CARBON	3.3K	5%	1/6W	
R352	1-247-823-00	CARBON	470	5%	1/6W	
R353	1-247-807-00	CARBON	100	5%	1/6W	
R354	1-247-887-00	CARBON	220K	5%	1/6W	
R355	1-247-815-00	CARBON	220	5%	1/6W	
R357	1-247-851-00	CARBON	6.8K	5%	1/6W	
R358	1-247-841-00	CARBON	2.7K	5%	1/6W	
R359	1-247-833-00	CARBON	1.2K	5%	1/6W	
R360	1-247-835-00	CARBON	1.5K	5%	1/6W	
R361	1-247-839-00	CARBON	2.2K	5%	1/6W	
R362	1-246-473-00	CARBON	1K	5%	1/4W	
R363	1-247-837-00	CARBON	1.8K	5%	1/6W	
R364	1-247-837-00	CARBON	1.8K	5%	1/6W	
R366	1-246-475-00	CARBON	1.2K	5%	1/4W	
R367	1-247-831-00	CARBON	1K	5%	1/6W	
R368	1-247-843-00	CARBON	3.3K	5%	1/6W	
R369	1-247-843-00	CARBON	3.3K	5%	1/6W	
R370	1-247-839-00	CARBON	2.2K	5%	1/6W	
R371	1-247-839-00	CARBON	2.2K	5%	1/6W	
R501	1-247-842-00	CARBON	3K	5%	1/6W	
R502	1-247-853-00	CARBON	8.2K	5%	1/6W	
R503	1-247-887-00	CARBON	220K	5%	1/6W	
R504	1-247-879-00	CARBON	100K	5%	1/6W	
R505	1-247-853-00	CARBON	8.2K	5%	1/6W	
R506	1-247-855-00	CARBON	10K	5%	1/6W	
R507	1-247-825-00	CARBON	560	5%	1/6W	
R508	1-247-815-00	CARBON	220	5%	1/6W	
R510	1-247-828-00	CARBON	750	5%	1/6W	
R511	1-247-813-00	CARBON	180	5%	1/6W	
R512	1-247-846-00	CARBON	4.3K	5%	1/6W	
R513	1-246-457-00	CARBON	220	5%	1/4W	
R514	1-205-662-00	CEMENTED	7.5K	5%	7W	
R515 ⚠	1-246-443-25	CARBON	56	5%	1/4W	
R516	1-247-868-00	CARBON	36K	5%	1/6W	
R518	1-244-855-51	CARBON	180	5%	1/2W	
R519	1-247-855-00	CARBON	10K	5%	1/6W	
R520	1-247-819-00	CARBON	330	5%	1/6W	
R521	1-247-831-00	CARBON	1K	5%	1/6W	
R522	1-213-140-00	METAL OXIDE	560	5%	1W	F
R523	1-247-830-00	CARBON	910	5%	1/6W	
R524	1-247-123-00	CARBON	470	5%	1/4W	F
R525	1-247-857-00	CARBON	12K	5%	1/6W	
R526	1-206-692-00	METAL OXIDE	15K	5%	2W	F
R527	1-247-848-00	CARBON	5.1K	5%	1/6W	
R529	1-215-449-00	METAL	15K	1%	1/6W	
R531	1-212-361-00	METAL OXIDE	1.2	5%	1W	F
R532	1-247-837-00	CARBON	1.8K	5%	1/6W	
R533	1-247-586-00	CARBON	3.9K	5%	1/8W	
R534 ⚠	1-247-840-31	CARBON	2.4K	5%	1/6W	
R535 ⚠	1-247-863-31	CARBON	22K	5%	1/6W	
R536	1-247-831-00	CARBON	1K	5%	1/8W	F
R538	1-213-146-00	METAL OXIDE	1.8K	5%	1W	F
R539	1-247-831-00	CARBON	1K	5%	1/6W	
R540	1-247-879-00	CARBON	100K	5%	1/6W	
R541	1-247-887-00	CARBON	220K	5%	1/6W	
R544	1-213-142-00	METAL OXIDE	820	5%	1W	F
R545	1-247-879-00	CARBON	100K	5%	1/6W	
R546	1-206-705-00	METAL OXIDE	150	5%	3W	F
R547	1-247-015-00	CARBON	2.2K	5%	1/4W	F
R550	1-212-361-00	METAL OXIDE	1.2	5%	1W	F
R551	1-246-472-00	CARBON	910	5%	1/4W	
R552	1-247-037-00	CARBON	390	5%	1/8W	F
R553	1-244-863-51	CARBON	390	5%	1/2W	
R554	1-247-809-00	CARBON	120	5%	1/6W	
R555	1-246-472-00	CARBON	910	5%	1/4W	
R558	1-247-847-00	CARBON	4.7K	5%	1/6W	
R560	1-247-855-00	CARBON	10K	5%	1/6W	
R564	1-247-851-00	CARBON	6.8K	5%	1/6W	
R565	1-247-903-00	CARBON	1M	5%	1/6W	
R571	1-215-373-31	METAL	10	1%	1/6W	
R572	1-247-879-00	CARBON	100K	5%	1/6W	
R573	1-247-855-00	CARBON	10K	5%	1/6W	
R574	1-247-841-00	CARBON	2.7K	5%	1/6W	
R575	1-247-440-00	CARBON	10K	5%	1/4W	
R576	1-212-365-00	METAL OXIDE	2.7	5%	1W	F
R578	1-247-855-00	CARBON	10K	5%	1/6W	
R579	1-246-497-00	CARBON	10K	5%	1/4W	
R580	1-246-509-00	CARBON	33K	5%	1/4W	
R581	1-247-859-00	CARBON	15K	5%	1/6W	
⧓R582 ⚠		CARBON			1/4W	
⧓R583 ⚠		CARBON			1/4W	
R589	1-214-964-00	METAL	1M	1%	1/4W	
R602	1-205-701-00	CEMENTED	2.2	5%	10W	
R603	1-214-599-00	METAL OXIDE	68K	5%	1W	F
R604	1-244-885-00	CARBON	3.3K	5%	1/2W	
R606	1-247-865-00	CARBON	27K	5%	1/6W	
R607	1-205-700-00	CEMENTED	200	5%	20W	
R608	1-247-879-00	CARBON	100K	5%	1/6W	
R609	1-247-813-00	CARBON	180	5%	1/6W	
R616 ⚠	1-206-447-61	METAL OXIDE	2.2	5%	2W	F
R617	1-247-887-00	CARBON	220K	5%	1/6W	
R619 ⚠	1-202-719-51	SOLID	1M	10%	1/2W	
R620	1-213-156-00	METAL OXIDE	12K	5%	1W	F

VARIABLE RESISTOR

RV201	1-228-723-00	RES, ADJ, CERAMIC CARBON 4.7K
RV301	1-226-850-00	RES, ADJ, CARBON 4.7K
RV302	1-228-723-00	RES, ADJ, CERAMIC CARBON 4.7K
RV303	1-226-851-00	RES, ADJ, CARBON 10K
RV304	1-228-941-00	RES, VAR, CARBON 10K
RV306	1-228-941-00	RES, VAR, CARBON 10K

- The components identified by ⧓ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Select the resistance value according to SAFETY RELATED ADJUSTMENT.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No.	Part No.	Description	Remark
RV307	1-228-940-00	RES, VAR, CARBON 10K	
RV308	1-228-940-00	RES, VAR, CARBON 10K	
RV309	1-226-851-00	RES, ADJ, CARBON 10K	
RV341	1-228-941-00	RES, VAR, CARBON 10K	
RV501	1-228-727-00	RES, ADJ, CERAMIC CARBON 47K	
RV503	1-228-724-00	RES, ADJ, CERAMIC CARBON 10K	
RV504	1-228-723-00	RES, ADJ, CERAMIC CARBON 4.7K	
		SWITH	
S501	1-554-186-00	SWITCH, LEVER	
		FILTER	
SF201	1-404-227-51	SAWF	
		SPARK GAP	
SG501	1-519-063-XX	DISCHARGING GAP	
		TRANSFORMER	
T201	1-404-321-00	VIFT	
T202	1-404-181-00	COIL, VIF	
T203	1-404-181-00	COIL, VIF	
T204	1-403-367-00	COIL, SIF	
T205	1-404-411-00	COIL, SIF	
T206	1-404-153-00	VIFT	
T301	1-425-995-00	TRANSFORMER, INPUT	
T302	1-409-193-00	COIL 3.58MHZ TRAP	
T501	1-437-090-00	HDT	
T502 ⚠	1-421-394-11	TRANSFORMER, FERRITE (HPCT)	
T601 ⚠	1-427-479-11	TRANSFORMER (SOT)	
T602 ⚠	1-421-357-31	TRANSFORMER, LINE FILTER	
		THERMISTOR	
⚠THP601	1-800-686-32	THERMISTOR (POSITIVE)	
		CRYSTAL	
X301	1-527-722-00	OSCILLATOR, CRYSTAL	

****

♦	1-611-423-11	M BOARD			
		*******			
	1-230-347-11	VOLUME BLOCK, PRESET			
	1-553-503-00	SWITCH, PUSH (14 KEY)			
♦	4-365-112-00	HOLDER, NEON LAMP			
		CAPACITOR			
C001	1-108-377-00	MYLAR	0.01MF	10%	100V
C002	1-108-377-00	MYLAR	0.01MF	10%	100V
C003	1-108-377-00	MYLAR	0.01MF	10%	100V
C004	1-108-377-00	MYLAR	0.01MF	10%	100V
C005	1-123-330-00	ELECT	22MF	20%	16V
C006	1-108-377-00	MYLAR	0.01MF	10%	100V
		DIODE			
D001	8-719-911-19	DIODE 1SS119			
D002	8-719-911-19	DIODE 1SS119			
D003	8-719-911-19	DIODE 1SS119			
D004	8-719-911-19	DIODE 1SS119			
		NEON LAMP			
NL001	1-519-154-00	LAMP, NEON			
NL002	1-519-154-00	LAMP, NEON			
NL003	1-519-154-00	LAMP, NEON			
NL004	1-519-154-00	LAMP, NEON			
NL005	1-519-154-00	LAMP, NEON			
NL006	1-519-154-00	LAMP, NEON			
NL007	1-519-154-00	LAMP, NEON			
NL008	1-519-154-00	LAMP, NEON			
NL009	1-519-154-00	LAMP, NEON			
NL010	1-519-154-00	LAMP, NEON			
NL011	1-519-154-00	LAMP, NEON			
NL012	1-519-154-00	LAMP, NEON			
NL013	1-519-154-00	LAMP, NEON			
NL014	1-519-154-00	LAMP, NEON			
		TRANSISTOR			
Q001	8-729-204-83	TRANSISTOR 2SA1048GR			
Q002	8-729-245-83	TRANSISTOR 2SC2458			
		RESISTOR			
R001	1-247-855-00	CARBON	10K	5%	1/6W
R002	1-247-867-00	CARBON	33K	5%	1/6W
R003	1-247-831-00	CARBON	1K	5%	1/6W
R004	1-247-873-00	CARBON	56K	5%	1/6W
R005	1-247-847-00	CARBON	4.7K	5%	1/6W
R006	1-247-831-00	CARBON	1K	5%	1/6W
R007	1-247-863-00	CARBON	22K	5%	1/6W
R008	1-247-855-00	CARBON	10K	5%	1/6W
		SWITCH			
S015	1-552-437-00	SWITCH, LEVER			

****

♦	A-1330-487-A	C BOARD, COMPLETE	
		**********	
♦	1-602-373-00	C BOARD	
	1-526-616-00	SOCKET, CRT	
	1-526-616-00	SOCKET, CRT	
		CONNECTOR	
C2 ♦	1-506-371-00	2P PLUG (L)	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No.	Part No.	Description				Remark
		CAPACITOR				
C701	1-123-356-00	ELECT	10MF	20%	50V	
C702	1-129-737-00	FILM	0.047MF	20%	630V	
C703	1-102-249-00	CERAMIC	680PF	20%	2KV	
C706	1-101-804-00	CERAMIC	10PF	5%	500V	
		COIL				
L701	1-407-704-00	MICRO INDUCTOR 82UH				
L702	1-407-704-00	MICRO INDUCTOR 82UH				
L703	1-407-704-00	MICRO INDUCTOR 82UH				
L705	1-421-393-00	COIL, FERRITE CHOKE				
		TRANSISTOR				
Q701	8-729-322-78	TRANSISTOR 2SC2278				
Q702	8-729-322-78	TRANSISTOR 2SC2278				
Q703	8-729-322-78	TRANSISTOR 2SC2278				
		RESISTOR				
R701	1-246-455-00	CARBON	180	5%	1/4W	
R702	1-246-489-00	CARBON	4.7K	5%	1/4W	
R703	1-206-692-00	METAL OXIDE	15K	5%	2W	F
R704	1-246-489-00	CARBON	4.7K	5%	1/4W	
R705	1-246-455-00	CARBON	180	5%	1/4W	
R706	1-206-692-00	METAL OXIDE	15K	5%	2W	F
R707	1-246-459-00	CARBON	270	5%	1/4W	
R708	1-246-489-00	CARBON	4.7K	5%	1/4W	
R709	1-206-692-00	METAL OXIDE	15K	5%	2W	F
R710	1-202-824-00	SOLID	3.3K		1/2W	
R711	1-202-837-00	SOLID	82K		1/2W	
R713	1-202-824-00	SOLID	3.3K		1/2W	
R714	1-202-609-00	SOLID	33K		1/2W	
R715	1-202-841-00	SOLID	180K		1/2W	
R716	1-202-824-00	SOLID	3.3K		1/2W	
R717	1-202-719-00	SOLID	1M	10%	1/2W	
R718	1-202-549-00	SOLID	100	10%	1/2W	
R719	1-202-629-00	SOLID	220K		1/2W	
R720	1-202-846-00	SOLID	470K		1/2W	
R721	1-202-848-00	SOLID	680K		1/2W	
		VARIABLE RESISTOR				
RV701	1-224-644-XX	RES, ADJ, CARBON 4.7K				
RV702	1-226-105-00	RES, ADJ, CARBON 220				
RV703	1-222-644-XX	RES, ADJ, CARBON 4.7K				
RV704	1-226-105-00	RES, ADJ, CARBON 220				
RV705	1-224-644-XX	RES, ADJ, CARBON 4.7K				
RV706	1-226-063-00	RES, ADJ, CARBON 2.2M				
RV707	1-226-114-00	RES, ADJ, METAL GLAZE 2.2M				
		SPARK GAP				
SG701	1-519-063-XX	DISCHARGING GAP				
SG702	1-519-063-XX	DISCHARGING GAP				
SG703	1-519-063-XX	DISCHARGING GAP				
SG704	1-519-063-XX	DISCHARGING GAP				
SG705	1-519-063-XX	DISCHARGING GAP				
SG706	1-519-063-XX	DISCHARGING GAP				

****

♦:1-611-967-11 H BOARD
****

VARIABLE RESISTOR

RV901 1-224-904-00 RES, VAR, SLIDE 20K

****

MISCELLANEOUS
****

⚠.1-228-482-24 RESISTOR ASSY, HIGH-VOLTAGE
⚠.1-451-182-31 DEFLECTION YOKE (SY108A)
1-452-032-00 MAGNET, DISK; 10MM ϕ
1-452-094-00 MAGNET, ROTATABLE DISK; 15MM ϕ
1-452-146-00 MAGNET, BMC

⚠.1-463-522-11 TUNER, ET (BT-898)
1-501-276-00 ANTENNA, TELESCOPIC (AN-18)
⚠.1-536-830-11 TERMINAL BOARD ASSY, ANTENNA
⚠.1-557-269-11 CORD, POWER
⚠ 1-562-443-11 CONNECTOR, ANTENNA

L901 ⚠.1-425-901-22 COIL, ERASE
L902 ⚠.1-425-901-22 COIL, ERASE
S901 ⚠.1-552-658-41 SWITCH, PUSH
SP901 1-502-766-00 SPEAKER
T503 ⚠.1-439-254-12 TRANSFORMER ASSY, FLYBACK

V901 ⚠.8-738-706-05 CRT (520SB22A)

****

ACCESSORIES AND PACKING MATERIALS
****

4-349-950-00 BAG, POLYETHYLENE
4-366-376-01 LABEL (B), INDICATOR
4-491-213-22 INSTRUCTION
4-493-886-21 MANUAL, INSTRUCTION
4-310-638-00 BAG, POLYETHYLENE

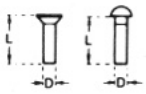
4-365-131-00 CUSHION (UPPER) (ASSY)
4-365-132-00 CUSHION (LOWER) (ASSY)
4-365-174-01 INDIVIDUAL CARTON (KV-1961)
4-365-175-01 INDIVIDUAL CARTON (KV-1962)

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

HARDWARE NOMENCLATURE

Screw:

– P 3 x 10
- *L: Length in mm*
- *D: Diameter in mm*
- *Type of head*
- *Indicated slotted-head only. Unless otherwise indicated, it means cross-recessed head (Phillips type).*



Nut, Washer, Retaining ring:

N 3
- *Diameter of usable screw or shaft*
- *Reference designation*

Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		brazier-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	

9-963-203-01

Sony Corporation

84A0559-1
Printed in Japan
© 1984